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MODERN MATHEMATICAL EDUCATION OF A TEACHER AS A BASIS FOR HIGH PROFESSIONAL COMPETENCE

If you would train yourselves alone,
You'd have some wisdom of your own;
Shevchenko T.G.

In today's world the educational status of its citizens is still one of the most important characteristics of a society. It is also an indicator of its competitiveness. The idea of the role of education in producing harmonious relations between people and nature, people and society, and influencing culture is not new, its roots reach from the Age of Enlightenment (Claude Helvetius, Denis Diderot, etc.) when it was considered that this activity was capable of creating such morals in people who will then improve social order and enhance the prosperity of the nation. Many modern scientists and experts note the leading role of education in societal development and in the civilized progress of mankind. For example, Russian psychologist A.G.Asmolov convinces us that "education, consciousness define all our existence, make up our souls nowadays" (A. Асмолов 1995, s. 4). Analyzing the advancing role of education, it is interesting to turn to A.S.Makarenko's experience and his principle of parallel action. His understanding of the natural combination of psychological bases of development in individuality and dynamism, and also his optimistical belief in the boundless opportunities of children led him to believe that the abilities of pupils can even be advanced socially in human relations and evocation. "Frontward run" of a like nature is humane. It eulogizes the personality and provides it with the prospect for "tomorrow's pleasure". A.S.Makarenko considered that it is necessary "to display images of tomorrow in group daily, they buoy the person up and charge them with joy to this day." (A. Макаренко 1984 , s. 472).

In the conditions of modern advancing education which has to solve problems of the socialization of a younger generation and its preparation for development of new Ukrainian society, the next generation of teachers should recognize their responsibility for results of their work. In turn society should comprehensively provide for and adequately appreciate a teacher's work. Since the time of O.Makedonsky it has been thought that teachers should be respected even more than our own fathers, because they provide our lives not only with physical things, but eternal things as well. O. Bismarck's remark on the role of the national teacher in providing a victory in the war is pertinent as well.

Unfortunately, it should be noted that we have not been observing any sweeping changes in society in relation to the pedagogical profession in general in recent years. "Education did not

become principal in our society", - modern journalism notes. The main barrier which our education can't overcome is a platitude. It is a minority of teachers with a strong personality. It is unwillingness of teachers to study. It is a general swank" (Ю. Пономаренко 2007).

The data from the last sociological survey of self-appraisal of future teachers that was carried out at the Poltava National Pedagogical University, named after V. G. Korolenko, showed that just 33% of students of Psychological-Pedagogical Department and 42% of Department of History declared the fact of an adequate self-appraisal. Therefore researchers recommended to direct the activity on the stage-by-stage achievement for the best results, overcoming the barrier of inferiority and formation of desire to self-improve and selfaffirmation in life (Матеріали міжнародної науково-практичної конференції 2012, s. 159-160).

In recent years we have dealt with analytical materials and research that are connected with the problem of so-called "professional burning out of teachers". In 2002 just 9.1% of queried respondents among children and 11.4% among parents noted the existence of high level teacher authority as reported by the director of Institute of Pedagogical Education and Formation of adults NPA of Ukraine I.A.Zyazyun. It is the proof that the profession of the teacher is losing its prestige. There is a discrepancy between the public role and the social status of a teacher" (Матеріали міжнародної науково-практичної конференції 2012, s. 34).

The solution for the problem of the formation of individuality in the XXI century depends on the teacher these days. They are supposed to have a creative personality whose imaginative and pedagogical activity becomes a reliable inspiration for the formation and full development of all people. In general, creativity is a term that defines creative abilities of the individual which is characterized by the ability to produce essentially new ideas. The analysis of scientific sources allows them to synthesize the following set of qualities of the creative personality: ease and efficiency of thinking, its flexibility, originality, accuracy, logicity, sequence, problem and search style; high level of moral and social consciousness; creative fantasy and developed imagination; specific personal qualities (courage, readiness to take risks, enthusiasm); specific leading vital motivations (aspiration of self-realization, desire to acknowledge, creative interest, enthusiasm for creativity, aspiration to reach the greatest productivity in specific work conditions); ability to self-administration; communicative abilities; high level of general and professional culture.

Today the first task of higher education is to train specialists who are creative, responsible, have initiative, ready for self-realization and can adapt fast in new conditions. Creative, highly educated specialists-researchers with initiative are needed in today's modern society. The fundamental nature of education demands investment in deep, intrinsic bases and relations between various processes of the world around. It should be noted that the modern sense of professional education is completely eclectic: except for elements of science bases, various data and

schematically submitted concepts on philosophy, psychology, cultural science, sociology, different humanitarian, natural and technical sciences are reported to experts. Eclecticism of education leads to unsystematic character of students thinking, inhibits a knowledge conglomerate, causes a complex of unsystematic facts, data, dates, formulas and algorithms. Insufficient integration, weak discipline, "isolation" of some subjects which prevents getting systematic knowledge and education fundamentalization which is customary for modern educational world.

The sharp growth of a role of such a fundamental educational branch as mathematics is observed in different spheres of the professional activity of a person in the conditions of modern modernization and informatization of work. Mathematics is the effective tool of interpreting difficult biological, economic, ecological, spiritual, socio-political, physical, chemical and other processes. Considering this there is a problem of the mathematization of knowledge among modern experts regarding the requirements of assuring effective functioning of different branches of production and the organization of public life. Consequently scientific searches of the development of mathematical thinking of the experts acquire special significance. The development of thinking is directed on modeling and solution of any tasks by means of mathematics. Its structure consists of intuitive, logical, numerical, symbolical and spatial components. Such types of thinking as theoretical, practical, creative and intuitive are harmoniously combined in mathematical thinking.

Scientists-researchers agree that modern mathematical education in a higher educational institution needs to be considered as a vital part of the interconnected processes: formation of motivations, acquisition of knowledge and skills; acquisition of mathematical knowledge and skills; development of informative independence of students during the application of mathematical knowledge and abilities; usage of mathematical methods in professional activity. All this is provided with passing the complex of mathematical disciplines (in particular, "The mathematical analysis", "Linear algebra", "The theory of probability and mathematical statistics", "Mathematical programming", etc.) which represent a theoretical and practical side of the sense of mathematical education. Today the substantiation of the importance of mathematical education is one of defining pedagogical conditions which will promote the development of the full-fledged mathematical thinking of students and provide the efficiency of studying of mathematical disciplines at the higher school.

As Professor B. V. Kovalchuk defines the mathematical education as a process which is the result of the assimilation of the system of knowledge from the bases of mathematical sciences, acquisition of skills to solve mathematical tasks, the acquirement of mathematical methods of perception, development of mathematical thinking, mathematical abilities, and spatial imagination by future teachers. It is also an achievement of mathematical literacy and the formation of set competences necessary for the performance of professional functions on this basis (Матеріали

міжнародної науково-практичної конференції 2012, s. 124). The sense of mathematical education should be considered in the context of higher education in general. It is the structure, the content and scope of the educational information which assimilation provides the person with the chance of getting education and full qualification. Also the system of knowledge, abilities and skills of the person, his professional, world outlook and public qualities that must be created in the process of study with a glance to prospects of society development, science, equipment, technologies, culture, art (Енциклопедія освіти 2008, s. 321).

Proceeding from this, the sense of mathematical education must provide theoretical, methodical and practical readiness for future teachers to successfully practice their educational achievements in their professional pedagogical activity. Here we are speaking about standardization of the mathematical background at higher schools, about the orientation of courses of mathematical disciplines. The sense of mathematical education must be formed this way so the studying of mathematical disciplines at higher schools will be conducive to forming an effective complex of mathematical competences which make provision for formation of valuable installations and the motivation of training (a valuable component), assimilation of theoretical bases of mathematical sciences (a knowledge component), development of practical skills to solve mathematical problems, skills of independent work (an activity component), development of abilities and skills of mathematical modeling (a productive component).

The latest research of domestic and foreign authors finds that the greatest difficulties in study are connected with educational overworking. The negative influence of educational overworking on the quality of education considerably increases the tendency of refusal of a combination of the linear and concentric principles of creation of training programs in domestic didactics in the XX century.

On the other hand teaching that is only linearly built and overloaded with factual material programs causes considerable difficulties in assimilation of the major scientific concepts and laws which amplify in connection with objective circumstances (for example, absence from school due to illness etc). According to concentric programs some researchers of study present it as a paralogism regarding the assimilation of a subject.

Famous German didactist L. Klingberg confirmed the relevance of a problem of a combination of linearity and concentricity of training at one time. In his opinion, "widespread representation that main knowledge is possible to impart 'at one stroke' belongs to those mechanistic ideas of study which are unacceptable for the dialectic concept of process" (Л. Клингберг 1984, s. 92).

In our opinion, training programs for the courses of mathematical disciplines at different faculties are supposed to develop in such a way. They are built so that the main principles of the selection of the content of mathematical education at the higher school are taken into account.

The important element of high professional competence of the teacher-mathematician is his adequate method learning. Head teachers are always respected at any school. They can bring training material to any audience in an accurate system, logically and evidentially, brightly and visually. They can induce its creative assimilation, practical application and productive use of possibilities of independent study of additional information sources. Not by coincidence academician I. P. Pavlov emphasized that the methodical side is the very first and the most important thing in work. It's because a not so talented person can make a lot with good method and even an ingenious person will do poorly with a bad method.

The methodical sciences must play the leading role in the solution of this problem. Research into the contents of textbooks and techniques of teaching of mathematics gives the reasons to claim that methodical concepts of study that had been tested were not considered appropriate. In objective methods which focus on the separate topics of training courses, attention is mainly given to disclose the logic of a statement of material, to identify inter-subject relations, to analyze the main types of problems which need to be solved for reinforcement and the best assimilation of a material.

The approach to the analysis of a problem of G. O. Mikhailin is more productive. In his monographic research he considers the methodical side of teaching mathematics as an important part within the professional culture of the mathematics teacher in general (Г. Михалін 2003). In scientist's opinion the knowledge of programs, thematic plans of a course, the contents and structure of textbooks, the methodical editions, all educational documentation, free orientation in techniques and modern ways of carrying out of lessons, accounting of inter-subject relations for utilization of the process of study of mathematics and so forth.

A teacher's own abilities and his aspiration to teach others to have an ability of systematization and generalization of a training material are the necessary components of methodical teacher education. Insufficiency of these abilities is a very important reason for the weak possession of a system of knowledge that can lead to further negative consequences in the professional activity of the teacher and his students. Systematization is an ordering of knowledge on the basis of extremely wide general characteristics of a group of objects. The technique of generalization and systematization of knowledge is based on the concept that these concepts become an obligatory component of teaching and study. Herewith the teacher uses all levels of generalization and systematization such as initial, conceptual, inter-conceptual, thematic, total and inter-subject (Я. Жовнир, В. Рябчинская 1987).

Professional teacher efficiency to organize not only educational-informative, but also educational research and scientific research work is an integral part of a qualitative mathematical education. This work is connected with the search for answers to creative, problematic-research and tasks with a previously unknown solution (result) (Збірник наукових праць викладачів, аспірантів, магістрантів і студентів фізико-математичного факультету, s. 90). It demands some reconsideration of pedagogical experience taking into account that scientific research work is a necessary and difficult component of the educational process. It also demands the use of the potential of different types of teaching and educational activity when studying mathematics for carrying out research work, and the main thing is to rouse the interest of teachers with scientific research that is carried out at departments in educational institutions, inside the country and abroad. The accomplishment of individual scientific research tasks within an educational subject, drawing attention to the preparation of term papers, degree papers, master's papers with independent research activity, the inclusion of tasks of a research character to teaching practice, performance of student's scientific works and their presentations at competitions of student's works of different levels, participation in scientific conferences and so forth promote the use of scientific research activity among students. The possession of a basic knowledge in the subject of research and logic of scientific research; skills to work with literature and technical data storage devices; skills to analyze such literature, systematize it, generalize it and structure it; readiness to plan their own research work independently and put it into practice; power to analyze their own activity and find ways for selfdevelopment; existence of the high informative energy and adequate self-concept have a special value in this paper.

Carrying out the lessons on the technique of teaching mathematical disciplines by experienced and authoritative experts in higher educational institutions is essential, but continuous exercises, independent work, training, reciprocal attendance of lessons by colleagues, continuous experiments and self-checking, self-criticism, optimism and belief in boundless opportunities of self-improvement are the best helpers in this case.

Therefore, the education system of Ukraine must make a means for the balanced growth of a young person as a complete personality and promote the development of abilities and talents. This way the intellectual potential of the person, his spirituality and culture get enriched. Renewal of the sense of education, in the direction of satisfaction of modern needs of personality and society, demands the further improvement of the study process. The concept of basic mathematical education in Ukraine defines the priority of acquiring methods of study and appliance of the latest information communicative technologies.

The relevance of a problem of providing an appropriate level of mathematical education is caused by the wide modern opportunities in development of logical thinking of the person, his

imagination, algorithmic culture, culture of the reason for approving, and the modeling of various processes at mathematics study. All this is possible only upon the condition of high-level professional achievement in the mathematical and methodical culture of the teacher. The basis of this culture is supposed to be attained during the study in a higher pedagogical educational institution, in particular in the process of studying of vocational subjects. Its improvement lasts during ones whole life. So it helps to remember the testament of the great Kobzar (T.G Shevchenko) including his words about the permanence of mathematical education quality today, that were taken out by us as an epigraph at the beginning of this article.

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