UDC 378

ABOUT MEANS OF DEVELOPMENT OF STOCHASTIC THINKING OF STUDENTS IN THE SYSTEM OF SECONDARY VOCATIONAL EDUCATION

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This article presents specificity of the learning process of mathematics in the OSS system. It makes the attempt to reveal the structure of stochastic thinking and presents the principles and means of teaching mathematics, contributing to the improvement of stochastic competence and the model of teaching mathematics in the OSS system with the aim of developing stochastic thinking of students.

While speaking about theoretical justification and practical development of the technique of students stochastic thinking in the system of secondary professional education (further SPE) the concepts of development of thinking (in particular – mathematical) have been already mastered; the attempt to reveal the notion of the concept "stochastic thinking" is made. We carried out the analysis of the conceptual works of Arzumaniyan N.I., Dvoryatkina S.N., Ponomareva Yu.I., Tarasov L.V., Shapovalenko T. G., Skol S.V., etc. according to the purpose of the dissertation research. Having analysed the conceptual framework applied by researchers in the field of problems of the development of stochastic thinking and also believing that stochastic thinking is a part of mathematical thinking, we presented the model reflecting the main components of stochastic thinking:

In Fig. these components are presented. The first three blocks of the scheme (located above) are components of stochastic thinking by means of which stochastic thinking is formed. Other three blocks of Fig. (located below) are components of stochastic thinking by means of which this type of thinking is shown. By means of the allocated components it is possible to estimate the level of development of students' stochastic thinking.

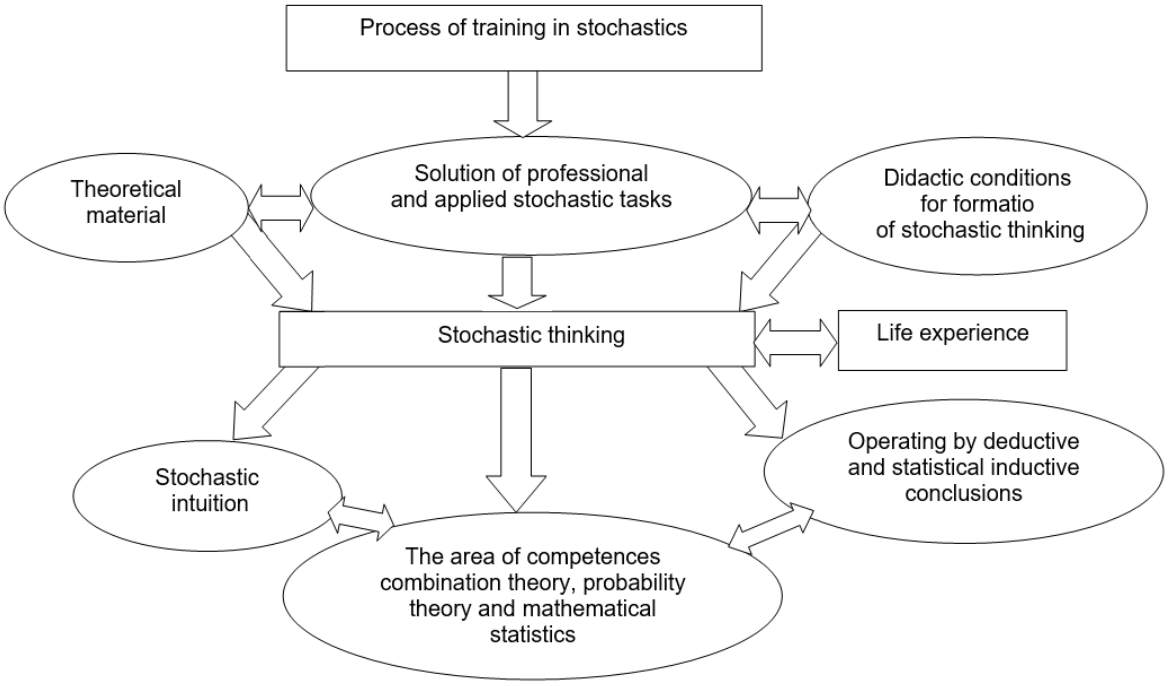

Figure. – The model of interrelation of the main components of stochastic thinking

At the same time stochastic thinking is generally formed as a result of purposeful training in elements of stochastics and, partially, - with acquisition of "knowledge of life".

The results of primary diagnostics of development of students' stochastic thinking in the SPE system that we have carried out allow us to claim that the main characteristics of stochastic thinking which are listed above

are not related to the most of the students of the SPE system at a rather high level. Therefore, having chosen the improvement of students' stochastic competence as an objective of training in mathematics, it is necessary to realize that the level of students' primary stochastic representations is very low. It is necessary to proceed from these entry conditions to the design and development of the technology of the organization of educational cognitive activity.

At the same time it is necessary to remember that in the SPE system the following provisions can be a theoretical basis for the technique of the development of students' stochastic thinking.

I.Principles of training in mathematics, promoting improvement of stochastic competence of students of the SPE system:

1) Principle of interrelation of the probabilistic, the combinatory and the statistical components of the stochastic line of mathematical subjects.

2) The principle of the continuity between the course of mathematics in the secondary school and the subject of mathematics when training in the SPE system.

3) The principle of integration of the stochastic line into the curriculum of mathematics when training in the SPE system.

4) The rinciple of stage-by-stage development of the actions (including intellectual) which is difficult for this category of students.

II. The didactic conditions contributing to the development of stochastic thinking of students in the SPO system in the course of training in mathematics:

1) Creating of the favorable educational environment for the emergence of positive motivation for training in mathematics.

2) The use of active forms and methods of the training, also using them in the organization of independent students' cognitive activity.

3) The organization of search activity in the process of training in mathematics.

4) The differentiated approach in development of stochastic thinking of students with a support on their objective experience.

The above mentioned principles and conditions which should be observed for the development of stochastic thinking of students in the SPE system have to be applied while developing the functionality of the stochastic line of mathematics curriculum.

The theoretical material that is necessary for mastering competences in combination theory, probability theory and mathematical statistics, and, therefore, for the development of stochastic thinking is presented in the form of basic abstracts. The basic abstracts are composed during the lesson together with the students (some of the basic abstracts are prepared by a teacher in advance).

The realization of the activity approach in training is expressed, in particular, in carrying out educational experiments by students (for example: carrying out a stochastic experiment "throwing of a cube", the comparing of the classical definition of the probability and the formula expressing its statistical sense).

At the phase of investigating new facts, together with the teacher students analyze the situations presented in the picked up series of professional and applied stochastic tasks. As we understand the task arising in a real life situation or professional activity of the expert of a certain direction, containing mathematical terms in the majority and adapted for pupils taking into account a training profile which solution requires attraction of the stochastic device" [5, page 17] For example "a professional and applied stochastic task: 1. "In a sushi restaurant we have an offer: "Order any two sets of rolls and pay for only more expensive one", and they offer 4 types of rolls: Philadelphia, California, Alaska and Canadian. The visitor ordered two sets of rolls. What probability that these sets are identical?" 2. "The student learned only 6 out of 11 questions for an examination. In the examination card there are 3 questions. If the student answered at least 2 of them, would he pass the examination with a good mark? What is the probability to pass the examination?" [3, page 19]

At this stage the process of the solution of such tasks is not implemented by students independently. This work is carried out together with a teacher through the discussion of task texts, the problem situations, the discussion of the plan of the problem. The elements of a problem method of training are used, and students have an opportunity to address the basic abstracts which are partially completed by them independently.

At the stage of the use of the studied material while solving the problems it is appropriate to use different types of work developing communicative competences of the students: group and pair ones, combining them with individual forms of work. In the course of training the differentiated approach is

implemented, in particular, split-level tasks are offered for a student to choose. In the process of taking the decision students have to be ready to explain each step. They create stochastic model of the situation given in the task.

The teacher, first of all, acts as an organizer of educational and research activity, implements individual assistance to students.

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