

ARTICLE

## ACCOUNTING OF ETHNOPSYCHOLOGICAL FEATURES IN MATHEMATICAL TRAINING OF STUDENTS

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### ABSTRACT

In recent years, throughout the world including Russia special attention is paid to the mathematical training of students. This is due to the understanding of the need for a high level of mathematical education of the population to fulfill the tasks of creating an innovative economy and realizing the long-term goals of the country's socioeconomic development. The importance of the mathematical training of students at the present stage of development of a society is considered in the article. The article gives notice to the problems that arise in the process of mathematical training of students as well as reveals objective factors of reducing the level and quality of mathematical training at the university. Particular attention is drawn to the need of ethnic features accounting of thinking, the specifics of culturally conditioned behavior of people which largely determines the effectiveness of the educational process. The teacher's knowledge of the national-psychological characteristics of students will allow him/her to build relationships with a multinational team and select the most effective methods of working with the wards more competently. The article presents the results of diagnosing the personality traits of students of Russian and Mari nationalities. They were identified with the aid of the multifactorial personal technique of R. Cattell and the methodology of T. Liri designed to study the subject's representations of oneself and the ideal "I" as well as to study relationships in small groups. On the example of students of the Mari nationality the need for accounting of the ethno psychological characteristics of students in the process of their mathematical training is substantiated. The materials of the article are interested to pedagogy specialists of higher and general education.

### INTRODUCTION

In recent years, throughout the world including Russia special attention is paid to the mathematical training of students. This is due to the understanding of the need for a high level of mathematical education of the population in order to fulfill the tasks of creating an innovative economy and realizing the long-term goals of the country's socioeconomic development.

The Concept for the Development of Mathematical Education in the Russian Federation, approved by the Decree of the Government of the Russian Federation No. 2506-r dated December 24, 2013, emphasizes that "the study of mathematics plays a backbone role in education developing human cognitive abilities which include logical thinking"[1]. At the same time, special attention is paid to the situation of the isolation of mathematical education in universities from modern science and practice, its level decline and the lack of a mechanism for its timely updating content.

Among the problems arising in the process of mathematical training of students at the university we identified:

- I. Insufficient level of mathematical training at entry the university;
- II. Large volume of educational material which requires additional study;
- III. A high degree of abstraction in the content of mathematics;
- IV. Lack (low level) of the system of mathematics adaptive learning for different groups of students;
- V. Separation of the content of mathematical education from future professional activities;
- VI. Low level of applied (practical) orientation of mathematical training;
- VII. Shortage of teachers applying modern techniques to teaching mathematics [2].

The reduction in the number of hours of lectures in mathematical disciplines can be attributed to objective factors of level and quality reducing of mathematical training at the university. All above mentioned issues require a qualitative revision of the technique and methodology of organizing the system of mathematical training of students based on the principles of adaptation and individualization of the learning process. The purpose of our research is to study the need of accounting students' ethno psychological characteristics in the process of their mathematical training.

### LITERATURE REVIEW

It should be noted that, despite certain developments in the field of the ethno didactic approach [3, 4,5,6,7,8], the national-psychological characteristics of the participants in the educational process have not yet been adequately reflected in the practice of its construction, and so far the attitude towards national problems is still as to the minor and even contrived ones.

But the consideration of ethnic features of thinking and specificity of culturally conditioned behavior of people in many ways determine the effectiveness of the educational process. The teacher's knowledge of

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the national-psychological characteristics of students will allow him/her to build relationships with a multinational team and select the most effective methods of working with the wards more competently. There is also the well-known fact about the specifics of perception of the surrounding world by representatives of different cultures, conditioned not only by cultural but also by physiological factors [8]. But this is not taken into account in the learning process. Our survey of teachers - attendees of advanced training courses bear witness to it. Few of them are aware of specific manifestations of a national character; while organizing the process of training they do not take into account the national and psychological characteristics of representatives of different ethnic collectives.

In the federal state educational standards for higher education of the third generation, a universal list of general cultural competences (GCC) has been defined and presented for bachelor's programs. From the position of the cult urological approach, in terms of ethno psychological features the following can be distinguished: the ability to communicate in oral and written forms in Russian and foreign languages for solving problems of interpersonal and intercultural interaction (GCC-5); the ability to work in a team tolerantly perceiving social, ethnic, confessional and cultural differences (GCC-6).

The phenomenon of culture is determined by the fundamental in the consciousness and understanding of pedagogical processes and phenomena, while highlighting the significant interrelations between [9]:

- I. Internationalization in the educational sphere and the national identity of different cultures;
- II. Standardization of the educational system and the diversity of the students' sociocultural orientations;
- III. The individual volume of mastered knowledge by the student and the volume of his/her "culturological repository";
- IV. The globalization of education and upbringing and the individualization of pedagogical influence.

It is interesting the study of Ch. M. Ondar, in which the national cultural component of mathematics education is revealed, pedagogical conditions for the formation of mathematical representations in students living in specific ethno-cultural conditions are given taking into account folk traditions [10].

In the work of N.A. Koroschenko attention is paid to the regional component of mathematical education taking into account interdisciplinary ties and study of local lore, practical and applied, general cultural and ethno-cultural orientation as well as the personal orientation of teaching mathematics against its socialization [11]. In the applied plan the problem is investigated by E.I. Yakshin who proposed a methodology and tools for teaching mathematics with regional content taking into account the perception and thinking of indigenous children [12].

## METHODS

For our research the important fact is that the function of learning by means of mathematics is of great importance for designing of the mathematical training system: the development of mathematical literacy and human culture, orientation in the surrounding world, the formation of the student's world outlook and personality education. It is important to show the application of mathematical knowledge not only in its applied meaning but also in the formation of the ability to see the surrounding world through the means of mathematics like science and art. Training involves the development of students in a multicultural perspective when each student should not only receive quality knowledge but also represent a single picture of the world, be a cultured and aesthetically developed person, be able to apply the achievements of any subculture in everyday life, in practice and in future professional activities.

This is still a field of psychological and physiological plan. And what is the specificity of the national character? Let us analyze it using the example of students of the Mari nationality for who the introverted style of behavior is typical in most cases, the external manifestations of communicative activity are modest, the affective reactions are meager, all this intensifies the inner strengths of feelings. They show special sensitivity to the emotional design of the communication process. Among the most attractive communicative qualities of the teacher they mark such as a kind approach to students, the ability to listen attentively to them, to show their empathy. In classes with such a teacher students feel more confident, are not afraid to express their own point of view, calmly answer questions, start a conversation on their own initiative.

It is necessary to note this feature of students of the Mari nationality as a choice of the communication style in dealing with "us" and "them". When communicating in a multinational environment, most students of the Mari nationality behave somewhat stiffly, uncertainly. They are little initiative, quite awkward in social contacts, prefer to keep silent, "stay in the shadow." While communicating within the framework of their ethnic community, students behave more confidently, more energetically and relaxed.

Our observations are also confirmed by the conclusions made by students themselves who note that they feel more comfortable in communication in their "own" mono-national environment. The teacher should not regard the modesty in actions and deeds inherent for the representatives of a given nationality as a manifestation of infertility and "averaging" of personality. Particular attention should be paid to their desire not to stand out among peers. This is explained by the fact that the Mari ethnos belongs to collectivist

cultures, where such behavior is regarded as unceremonious, not approved by society and modesty is more appreciated.

In the arsenal of teacher's methods of work with Mari students there must be ways aimed at stimulating their "success", self-confidence. It will be appropriate here to use the method of praise as the most effective in working with the representatives of the Finno-Ugric peoples. This is confirmed in a number of studies examining the ethno psychology of the Finno-Ugric peoples, which the Mari ethnic group also belongs to: "Apparently, we, the Finno-Ugric peoples, have some kind of general genetic program. This amazingly vulnerable fragility of the soul strikes. We always focus on praise. In this sense we are artists." S.L. Rubinstein said: "The artist needs praise, praise and once again praise." In this sense, we are really very talented artists. When we are praised, we become better. If we are criticized, we become worse. A break occurs in the soul which is very painful. The Chinese say: criticism is like a dove; it comes back. We do not need to be criticized - we are not "Chinese". We, as any other people, shouldn't be criticized; it is better to praise us. And we will certainly become better" [13].

Studies have shown that representatives of Finno-Ugric peoples have a tighter degree of interaction between the organism and the subject area, higher level of endurance, capacity for work; the transition from one program of behavior to another is difficult; lower plasticity and tempo. Rational emotional-sensory and thought-sensory introverts are the most common types among the Finno-Ugric ethnos [14].

Attention should be paid to the adaptive mechanisms of interpersonal communication, also conditioned by the peculiarities of culture: what are the indicators of conformity, the most typical ways of resolving conflict situations, helping behavior, etc. Conformity is viewed as the position of the individual relatively to the position of the group reflecting the measure of its subordination to the group pressure." Often the Mari were accused of excessive conformity, obedience, concessions, rejecting the fact that the Mari culture highly appreciates harmonious kind relationships with others, and the conceding to the majority is seen as a manifestation of tact and social sensitivity, which is highly desirable phenomenon, social value and the norm [15].

A researcher of the psychology of the Mari ethnos V.A. Sokolnikova notes: "The Mari are hardworking, hospitable, modest, eager for knowledge, patient. They have a sense of dignity. They experience a special divine attitude to nature. They adhere to national holidays, rituals, traditions and customs. There is an instinct of self-preservation in the ethnos that does not allow them to go beyond that line followed by self-destruction, which in turn leads to the desire to avoid any form and manifestation of national and international conflicts, strife, wars, and internecine strife" [16].

## RESULTS

Let us turn to the conclusions of an experimental character. In order to identify the personal characteristics of students of Russian and Mari nationalities, we used the multifactorial personal method of R. Cattell [17]. In accordance with the methodology, the personality of each student was described by 16 fundamentally independent and psychologically significant factors, which have symbolic names and presuppose a stable probabilistic connection between individual personality traits. The results of the study conducted with students of Russian and Mari nationalities indicate that most of them have less pronounced such a personality trait as subordination-dominance (factor E according to Cattell's methodology). The average level of development of subordination-dominance was revealed in 87% of Mari students and 78% of Russian students. 16% of Russian students have an indicator of dominance. The students of the Mari nationality found this indicator in 10%. The indicator of subordination was manifested in 6% of students of Russian nationality and 3% of students of Mari nationality. These data indicate that representatives of Russian nationality were more dominant.

We used the technique of T. Liri, designed to study the subject's representations of himself and the ideal "I", to confirm the results and also to study relationships in small groups [17]. With its help, we identified the prevailing type of student relations on two factors: "domination-subordination" and "friendliness-aggressiveness (hostility)." According to Liri's method, we found out that 71% of Russian students and 65% of Mary's students showed a low level of personal obedience. At the average level, 31% of Mary's students and 24% of Russian students showed their obedience. At a high level, 4% of students of the Mari nationality and 5% of students of Russian nationality showed their obedience. The results obtained by both methods showed that students of the Mari nationality are more obedient, conformal, and students of Russian nationality are more dominant.

## CONCLUSION

According to the results of the study, it can be concluded that the "inferiority complex" is still a very common phenomenon among young people. Its essence lies in the desire of young people to "get away" from their own ethnic culture which is not dominant in the bicultural environment. They prefer to refer themselves to the dominant group ("I'm not a Marian, I'm a Russian").

The task of teachers in working with such students is to increase the attractiveness of their own ethnic group, increase its social status and develop ethnic self-awareness.

All this will make it possible to solve the tasks of the educational plan more effectively as well the mathematical training of students.

#### CONFLICT OF INTEREST

There is no conflict of interest.

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#### FINANCIAL DISCLOSURE

None

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