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THE MOTIVATION OF BILINGUAL STUDENTS IN MATHEMATICS AND INFORMATION TECHNOLOGY EDUCATION

Silvena Milanova
Bishop Konstantin Preslavsky University of Shumen (Bulgaria)

Abstract. This article examines what constitutes bilingualism in school. What is education for these students. What difficulties do bilingual students face in mathematics and information technology and whether teachers succeed in motivating them. Whether education is important to them and to what extent. Is attention paid to teaching bilingual students? The role of mathematics and information technology (IT) education for the integration of students in a bilingual environment?

Keywords: bilingual students; difficulties; education; motivation; different ways for teaching

The concept arises in connection with the study of the linguistic behavior of a person using two languages for communication. A number of researchers (Pavlenko 2006; Grosjean 1982; Heinz 2001) focus on bilingualism. Each of them shares a different interpretation of the term. As Bhatia (2014) shares, until now there is no widespread and universally valid definition of bilingualism and how it can be measured.

Romaine (1995) is against the position that the two languages should be equally proficient, as he believes that it derives from a multilingual perspective and does not capture the essence of bilingualism. According to Romaine (Romaine1995), absolute balancing and equal written and oral command of the two languages is impossible and unattainable.

There are several types of bilingualism (Paradis, Genesee, Crago 2011).

1. Simultaneous acquisition.
2. Sequential acquisition.

If the knowledge of the two languages is characteristic of individual members of the society, then this is individual bilingualism, if the contingent of speakers is large, it is a question of mass bilingualism.

1. What is bilingualism in secondary school?

The school is an institution for the socialization of adolescents. It is not just a place for learning, teaching and assessment. It is a center that organizes the processes of socialization in cooperation with all civil structures. The educational integration of bilingual students is key to their overall equal personal integration in Bulgarian society.

The school institution has a pivotal role in the process of inclusion of children from another ethnicity. The school is the "evaluating" mediator. It purposefully controls and offers opportunities to overcome the difficulties and contradictions that arose during the educational process. It looks for solutions to ensure the necessary conditions and create the appropriate psychological climate for the implementation of training of the highest possible quality. Of particular importance in this process is the unification of the efforts of educators and parents to achieve the goal – giving Roma children a chance for quality education and a better life.

And since education is not present in the value hierarchy of ethnic culture, the need to convince Roma parents of the benefit of education for the better realization of their children in life becomes necessary. Classroom communication is a complex process of information exchange and interaction between students and between students and teachers. Without communication, the transfer of knowledge is impossible. It is a daily experience, an essential component of all spheres of life. A meeting of the minds through questions and answers, actions and reactions. Sharing experiences verbally and non-verbally. Communication is another name for learning.

Innovations in education, innovative teaching methods and a person oriented approach are already widely used. The innovative methods and the individual approach find a particularly effective application in learning in a multicultural environment and in particular in the mastering of the Bulgarian literary language and the development of oral speech. Interactivity and play create a favorable atmosphere, provoke thinking, overcome the barrier in communication. Taking into account the individual abilities, interests and needs of students stimulates them to be active in the learning process, builds trust, understanding and friendship, favors the formation of social qualities and skills, the mastery of rules, norms and models of behavior that ensure full integration of the child's personality in the middle.

2. What are the difficulties of bilingual students in mathematics and IT classes?

One of the main problems in modern language teaching in the Bulgarian school is related to the understanding of a read text. A large number of students do not understand what they read. The reasons are of a different nature:

the presence of many foreign words in the texts (mainly anglicisms); non-compliance of the proposed texts with the educational level of the students; poor readability of the texts, poor command of the Bulgarian language by the students, etc.

Comprehension of a read text is a psycholinguistic problem and largely depends on the linguistic wealth of the student, on his active and passive vocabulary. Bilingual students have difficulties of a different nature – a poor vocabulary, they do not know basic concepts, the concepts of time are different and hence it becomes difficult to construct the verb tenses in the Bulgarian language. The family environment makes it difficult to learn the official Bulgarian language, as a large percentage of them are illiterate or semi-literate.

There are eight types of students who struggle and fail in math:
– Defects in biological development
– Deficits in mental development.
– Lack of positive attitude towards learning.
– Poor education.
– Lack of study habits.
– Negative extracurricular influences.
– Gaps in knowledge.
– Disadvantages of pedagogical impacts.

In order to track what teachers use as innovative materials, to overcome the deficits, I focused on several methods at the same time. In this way, we get a clearer idea of the way of teaching mathematics and IT according to the students. First I observed a traditional way of teaching, then teaching with the inclusion of presentations, multimedia lessons, game approach. Another method I used was a survey among bilingual students about their opinion on whether teachers use innovative and interactive work methods. In order to collect the necessary information for the study, I conducted surveys, talks and group and individual discussions among bilingual students from 7 different areas of the country.

According to a survey (fig. 1; fig. 2) conducted among bilingual students of different ethnicities, it can be found that teachers spend more time on them to learn to speak correctly and be more active in class, use different and diverse methods to have a higher result. However, the family environment is of great importance for these students, which for the most part hinders their learning.
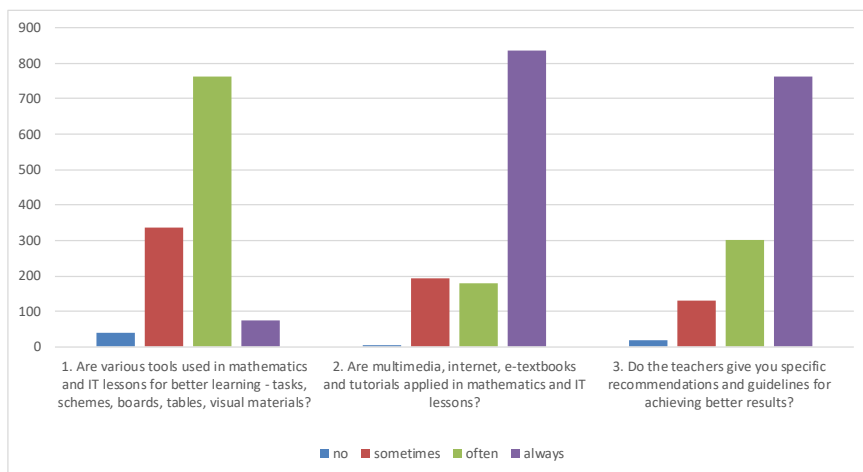
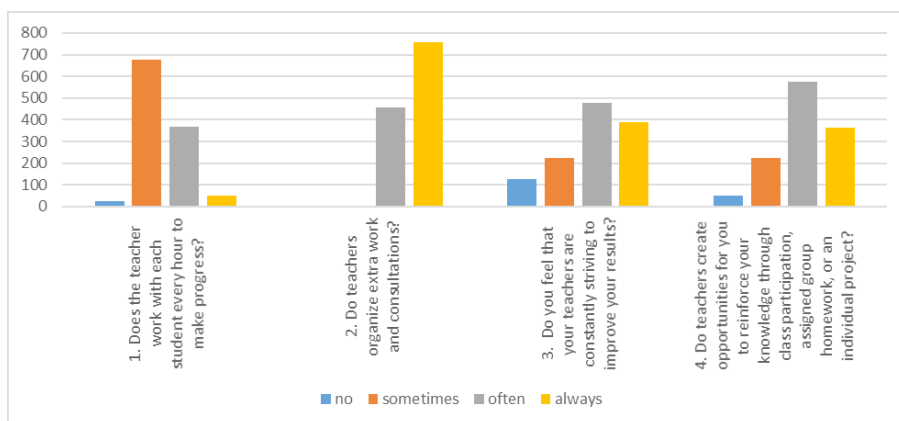**Figure 1.** Use of electronic resources in class according to students

Figure 2. Individual approaches of teachers

Learning is a long and complex process in which the teacher plays a key role in providing the conditions and environment so that the learners are the active party in it. Modern students have requirements and attitudes that are related both to some modern teaching methods and to an ever-increasing set of tasks related to everyday life and practice. to achieve educational goals, many teachers go beyond the framework of traditional education, using various

active teaching methods in their practice. using the possibilities of modern information and communication technologies (ict), every teacher could make the lesson interesting and attractive.

In order to ensure prevention, in the pedagogical interaction with parents, the teacher must take into account traditions that build the value system of the ethnicity. the fact that the positions of the teacher and the student in both societies are perceived differently is also particularly important. this requires knowing very well the specifics of each ethnic group. the teacher is required to try to change the attitudes of the parents regarding the possibilities for development, for social integration.

3. What are the difficulties of teachers when working with bilingual students in mathematics and it classes?

Modern teachers working in bulgarian schools with bilingual children are constantly in need of new and up-to-date methodical guidelines to stimulate and motivate students' attention in the learning process. learning is a long and complex process in which the teacher plays a key role in providing the conditions and environment so that the learners are the active party in it.

Modern students have requirements and attitudes that are related both to some modern teaching methods and to an ever-increasing set of tasks related to everyday life and practice. to achieve educational goals, many teachers go beyond the framework of traditional education, using various active teaching methods in their practice. using the possibilities of modern information and communication technologies (ict), every teacher could make the lesson interesting and attractive. working with bilingual children in mathematics classes is systematic.

The teacher must present the new knowledge comprehensibly, using various visual didactic means. such visual materials (presentations, boards, cardboard with geometric figures, thick spaghetti, straws connected with plasticine or matchsticks) can be prepared in advance by the teacher or made by the students during the lesson.

Education is the main way to acquire scientific knowledge. in its essence, it is a process of knowledge, in which learners acquire a certain system of knowledge, skills and habits. but the acquisition of knowledge is a goal and a distinguishing feature of any cognitive process.

Motivation is the driving force towards achieving certain goals. it stimulates the individual in his efforts to achieve the desired goals, and most often these are successes. in order to achieve a certain result, in addition to high motivation, daily purposeful activities are also required. from the point of view of learning, motivation is one of its most critical components. it is very difficult to measure and for this reason it is one of the most serious problems

in education. teachers begin to ask themselves questions such as: what makes a student want to learn and from there look for different ways and methods to achieve the desired effect.

Motivation is important not only to get students to participate in the learning process. it also depends on how much and what they will learn from the information presented to them. motivated students retain a greater volume of information. therefore, it is very important for teachers to keep students motivated. this can be done in many ways depending on the particular situation or group of students.

It is extremely important that students are given motivating feedback. they should not be allowed to put no effort into certain tasks, thinking that because they have not succeeded in a similar type of task before, they never will. it also affects them very badly to think that they will fail in a given activity. teachers should tell and show their students that they know that everyone can learn and thus help them to understand that success depends on their own efforts, that they cannot fail to succeed if they give their all are capable.

From a survey made through surveys, group and individual discussions and talks among 43 teachers from 5 cities, it can be found that most teachers rate their work with bilingual students as good or satisfactory [fig.3]. the main problem is that the parents have low motivation and interest in the education of their children, hence the motivation of the students themselves is low (fig.4).
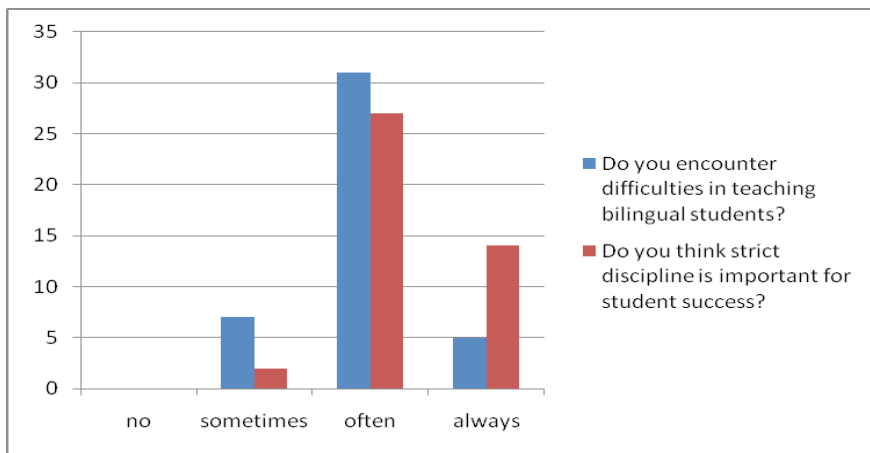

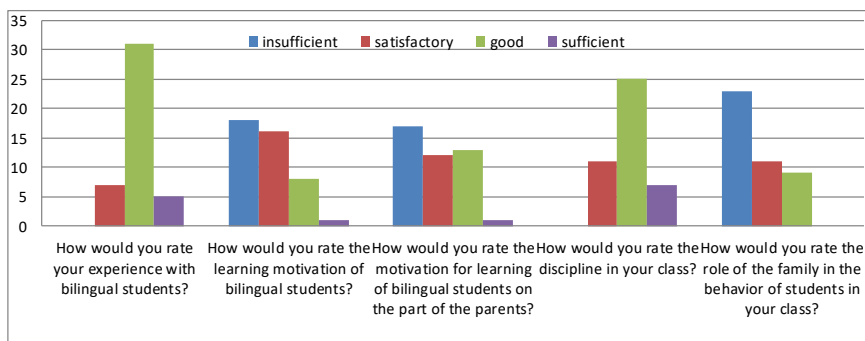**Figure 3.** Difficults in teaching bilingual students

Figure 4. Learning motivations of bilingual students according to teachers

To motivate their students, 99% of the surveyed teachers use multimedia, presentations that they prepare depending on the level of knowledge of the respective class. They use different and varied boards and materials so that they reach the students more easily. Distance learning in an electronic environment turns out to be the biggest problem, since the motivation of bilingual students is generally low, and thus the connection with these students and their families is completely lost. The platform that had to be worked with is quite clumsy and difficult for both teachers and students to use.

According to surveys, discussions, observations and individual conversations among teachers, their professional difficulties are due to several factors:

– They do not understand and do not speak the official language – Bulgarian;
– Education is not a priority first for parents and then for students;
– Limited vocabulary;
– They do not know how to express themselves;
– They don't know how to behave in class;
– There is not the necessary discipline, which is of great importance for knowledge and results, because students are sure that, despite everything, they will not have poor results in the end.

After they try once or twice and it doesn't work, they just give up. However, most teachers have also found other ways (printing out lessons developed, problems solved and analyzed in language accessible to them, etc.) to reach the lessons to these students in order to gain some knowledge. Although this is a huge effort on the part of the teachers, they do not give up because this is a problem of a large-scale aspect.

4. Why is it important to work on the success and motivation of bilingual students?

In the education of children from linguistic minorities, it is of great importance to create a supportive environment for them at school. In the process of inclusion of every child whose mother tongue is different from Bulgarian, not only educators, but also specialists from various institutions with administrative competences in this field should be involved. The first step is related to a study, the purpose of which is to make a comprehensive analysis of the educational needs of the specific child, related to the sociolinguistic situation in which he is placed. In recent years, Bulgaria has been looking for new ways to solve the problems related to the language development of bilinguals with a dominant mother tongue.

The most popular of them is the use of teaching assistants in schools with predominantly bilingual students. Unfortunately, the implementation of the teaching assistant program has been hampered in many ways. First of all, it is not possible to be financially supported by the state, therefore it is implemented only on a project basis, and the corresponding budgets are too limited to provide prospects for the committed assistant teachers. In addition, there is no system in the qualification of teaching assistants that prepares them as good specialists who can competently solve the problems accompanying the teaching. And last but not least – there is no legal basis to regulate this type of training organization.

All this dooms this program to failure. Over the past few years, we have witnessed revolutionary changes in the field of information and communication technologies. Obviously, these changes also lead to major changes in all spheres of life. For the field of education, the consequences are perfectly clear.

The school must provide adequate training to its graduates and prepare them for the challenges of information technology (IT) that await them, not only in their future jobs, but also in everyday life. The process of getting to know the surrounding reality is very complex and multifaceted. In it, all of humanity, as a whole and each person individually, moves from ignorance to knowledge, from one level of knowledge to another level.

The study subject "Information Technology" is practical, i.e. the knowledge gained by students is important to the extent that we manage to turn it into lasting skills for using the computer and software to solve practical tasks. In the high school stage, the following basic modules are included for study: Computer system; Working with graphic images, Sound and video, Computer word processing; Spreadsheets; Computer presentations; Internet; Project work. From the presented topic, it can be seen that both theoretical knowledge about a given technology and practical skills for its use must be acquired during IT training at the high school level.

Therefore, an information technology task should be related to a sequence of actions that students must perform on a computer. The development of mathematical

literacy is not related to the teaching of mathematics in school hours, but is aimed at the practical application of various mathematical knowledge.

In other words, to develop mathematical literacy in our classes is not to add specific mathematics content to the core subject we teach, but to provide our students with a very strong toolkit to help them effectively deal with challenges in our subject area. area. In this sense, the development of mathematical literacy in classes other than mathematics does not prevent the development of knowledge and skills in the specific subject, but on the contrary, it helps students deepen their understanding of the studied material and become an active party in the learning process.

Conclusion and summary

In conclusion, it can be said that depending on how students are introduced to concepts, it depends on whether they will be understood. It is important that students understand the content of the studied concept. Comprehension is a process of extracting the meaning and penetrating the semantics of the studied information. A large part of Roma students are characterized by passivity, they rarely ask the teacher with questions, do not complete homework, do not want to raise their hand and have a low level of knowledge and skills. The path of knowledge is difficult for them.

Failures are due to a lack of willpower, a manifestation of insecurity, an inability to control their learning actions. In the racial environment in Bulgaria, it is difficult to distinguish the cultural layers of the society, due to the different ethnicities living here. This is especially important for adolescent bilinguals who grew up in a different cultural environment from the Bulgarian one and for whom the construction of their identity is first from the side of their culture, and second from the side of the country in which they live. Also, the preservation of the culture, traditions, habits and way of thinking and behavior to which they were exposed will help their better motivation and success rate, realization and integration in the Bulgarian society.

Acknowledgments

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✉ **Mrs. Silvena Milanova, PhD student**
ORCID iD: 0009-0006-6892-6258
Faculty of Mathematics and Informatics
Bishop Konstantin Preslavsky University of Shumen
Shumen, Bulgaria
E-mail: silvena1167@abv.bg