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Robotics in elementary school

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Abstract

The advancement and development of new technologies requires teachers to introduce new teaching resources into the educational process of teaching Informatics and Computing. By introducing mBot in teaching in a creative and interesting way, students' motivation to develop and acquire digital and computer literacy has increased. The work shows mBot as a new, innovative tool that introduces students to the world of programming in a simple way. The results of the empirical research among the students of the seventh and eighth grade confirmed the premise of increasing motivation, as well as the development of the interest and curiosity of students in the field of information and computing. The students also showed great interest in participating in competitions and projects.

Key Words: MBot • Programming • IT education.

Introduction

Analysis of teaching aids, students' interests, their motivation to acquire new knowledge and skills contributes to the development of intellectual abilities of both teachers and students. Fostering curiosity, developing information and information literacy as well as computer thinking in students is the most important task of teachers. and technical thinking. With their application, the student is no longer a passive listener, but becomes active, they are given the opportunity and opportunities to become innovative, creative and to acquire new knowledge and skills independently.

In the curriculum of informatics and computer science, students from the fifth to the eighth grade study computer science and computer science in the amount of 36 hours. In fifth and sixth grade, they are introduced to the basics of block and text programming languages, so that when they encounter mBot in seventh and eighth grade, they already have sufficient background to work with it. We can also associate mBot as a teaching tool with the subject of technical and informatics education in which seventh grade students are introduced to robotics. mBot can move, can be controlled by a smartphone, can perform various tasks by writing program codes, has sensors that can be added at any time according to the needs of the task.

Materials and Methodology

In order for the teacher to evaluate and evaluate his / her own work, which would influence the corrections of his / her approach to students, it is necessary to obtain the students' opinions and objectively consider and incorporate them into his / her work in order to improve the teaching process. The aim of this research is to examine students 'satisfaction and interest in adopting a new teaching tool, as well as whether it affects students' motivation to acquire additional knowledge and skills. The aim was also to examine the extent to which the introduction of the mBot teaching tool affects students' willingness to independently upgrade and disseminate their acquired programming knowledge.

The survey was conducted through an anonymous survey, where students answered closed-ended questions offered through a questionnaire. It included 136 students of the seventh and eighth grades out of a total of 161, that is, a population of 84.47% of students, which we consider the sample to be representative.

Results

The gender structure of students is determined by the first question. 66 girls and 70 boys participated in the study, 48.53% and 51.47% boys were represented as a percentage. Table 1 show the gender structure of the students

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Gender structure	Number of students	% students
girls	66	48,63%
boys	70	51,47%

Table 1: gender structure of the students.

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The second question concerned the students' success at the end of the previous school year they had completed. None of the students at the end of the sixth or seventh grade had insufficient success, and their answers to the question of success are shown in Table 2.

Students' success	Number of students	% students
Great	83	61,03%
Very good	36	26,46%
Good	11	8,00%
Enough	6	4,41%

Table 2: *Student performance at the end of the previous grade.*

In the fifth and sixth grades, computer science and computer science as well as computer science sections are electives for students.

For this reason, the third, fourth, fifth and sixth questions related to the collection of data on the number of students who attended the subject of computer science and computer science, the number of students who attended the sections, the number of students who studied Scratch and APP inventory, and the number of students who were taught by Python, Ruby, C.

A large percentage of our sample attended the subject of computer science and computing in the fifth and sixth grades, 92, 38%. Informatics sections a much smaller percentage of students 31.03%. In terms of programming languages, students assessed their proficiency as insufficient for independent work.

Conclusion

The aim of the research is to examine the students' interest in the application of a new teaching tool, the mBot robot in the subject of computer science and computer science in the seventh and eighth grades. We examined whether modernizing teaching by introducing the mBot teaching tool increases students' motivation and interest in acquiring new knowledge and skills. We have learned that the mBot robot has increased the interest and therefore the students' motivation to learn programming and robot management. Another very important indicator is that the teaching process with the application of the new mBot teaching tool was more interesting and interesting, allowing students to acquire knowledge and skills in an easier and simpler way. Regarding the required background, which is a very important indicator for the entire teaching process, we received the answer that most of them require basic knowledge which tells us that students can compile, manage and execute basic mBot programming with the knowledge they already possess, and with greater interest programming skills. With the help of the mBot teaching tool, students can create, program and develop their skills over many years of education, refine, supplement and thereby develop their innovation and creativity.

Also, their interest and motivation is reflected in the achieved results in competitions in mBot robot programming at both national and European level. And the inclusion of the mBot robot and its programming through school-based projects. And that event sequence will feature an E-poster, where you can see the realization of the project "Clock" through the inclusion of a large number of uses of IT programs as well as programming of the mBot robots for the realization of the project.

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