Effect of Coding and Robotic Coding Training on Students

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Introduction

With the rapid development of technological developments, the use of robots in daily life is increasing with each passing time. In many areas, with the support of robots, people renew and develop themselves cognitively, socially and culturally. The Twenty-First Century, however, is called the age of technology.With the age of technology, many needs for education have emerged in the name of education.Thus, different structures and innovations in educational systems are required for meaningful and lasting learning. At the beginning of these innovations we heard a lot about, coding and robotics-coding, STEM, robot kit etc. such concepts come from.

Tenth development plan are examined, the main purpose of the Turkish education system democratic values, communication, self -, self-confident, Responsible, Entrepreneurial and innovative character of Science and technology prone to use, productive, and problem-solving ability enhanced perception, is referred to grow up as happy individuals.In the current age of Science and technology, coding education is seen as a very important element (Kalkınma Bakanlığı,2013).

Coding training refers to preparing software, website and mobile application through the code editor in any programming language.The research shows the use of robots in programming education as a learning-teaching strategy from easy to difficult and based on the project. (Akınıcı & Tüzün, 2016).In coding training, the robot loads the main tasks into the robot and the results are seen on the working system.

As a result of a research, it was found that robotic coding and computer coding skills with Python programming language can be taught more quickly and easily.It is also seen that with this programming editor they increase student motivation and gain experience in coding.They appear to have taken advantage of all the advantages of visual programming with fewer problems, with less effort than their previous approach(Resinovič, 2015).

An hour of Code event is held every year in more than 180 countries in the field of information technology, reaching millions of students and talking about the importance of coding education.In many countries, computer programming and robotics coding courses are taught as a compulsory course in schools. In our age, robotics is increasingly important to coding and is passed on as central lessons and basic skills that students need to learn in schools(Passey, 2017).

In Turkey, for the 2019-2020 academic year, the Ministry of Education has introduced

a new curriculum for high schools.The program includes algorithm programming in eleventh grade, biotechnology in twelfth grade, energy systems of the future, materials science, artificial intelligence applications, Internet of Things applications, etc. they must be studying.In addition, the Ministry of Education organized a workshop on production training with Informatics in June 2019.It has been determined that the Information Technology course will be the central course in 5 years.81 il 150 pilot primary and secondary schools, coding and 3D design activities will be carried out in order to gain production skills with Informatics (MEB, 2019).

In the work of Çankaya and others(2017), 9 students were given robotic coding training at a secondary school in Balıkesir province. At the end of the training his views were taken. Coding training using qualitative and quantitative methods has yielded positive results. Students achieved a high achievement average of. The students will be more successful in coding education with high creative problem solving skills.

A study has been conducted on the robotic coding model in the teaching of programming languages. In the study it is thought that arduino and similar platforms will offer an important solution in embodying abstract concepts, helping to physically observe the code (Ersoy, Gülbahar, & Madran, 2011).

Sayın and Seferoğlu(2016) in their study, drawing attention to coding education, they stated that in the future, coding-oriented courses will have more place in the curricula around the world. of turkey is among the world states in order to keep up with the development of coding training, coding for the issues stated in the curriculum should be given more space .

Göksoy and Yılmaz(2018) in their study,10 information technology teachers and 15 students who took robotic coding courses were interviewed about the course. According to the results of the research, it was revealed that robotic coding courses provide students with problem solving, creative thinking, numerical thinking, productive working, designing, systematic and analytical thinking and increasing and influencing their academic success.

Research has been carried out on the update of the curriculum of Information Technology and software course. 350 teachers were interviewed in the study. As a result of the interview, the rates in Table 1 are revealed. Primary education according to Table 1. the stated gains for the tier will be applied based on the activities.By establishing a bridge with the high school curriculum, the result is to ensure continuity in the teaching of Informatics subjects. (Gülbahar & Kalelioğlu, 2018).

Table1. Views on the Curriculum

Themes	Percent
Information technologies and software courses must be compulsory at all levels.	%27,7
Coding training should be available.	%15,2
Lesson hours should be increased.	%7,5

In the research conducted by Ince(2018), 16 associate degree students in the Computer Technology Department of the Vocational School of Technical Sciences at Süleyman Demirel University have put out projects on robotic coding. These events are 5. The project was exhibited in the exhibition and 16 students were interviewed. The result was that they were interested in robotic coding and their willingness to do projects made them aware of their willingness to do so and increased their professional self-confidence.

Research by Kasalak(2017) covered the applications of robotic coding shown at the secondary school level. It is aimed to determine whether there is a meaningful relationship between students ' interest and desire in block-based coding. Furthermore, the lives of 58 students in public school related to robotic coding practices were investigated. The results emerged that the students found the applications fun and engaging, that they were willing to participate in the applications, that the applications contributed positively to their personal development.

In one study, MBOT robot Kit easily embodied the effects of abstract concepts with the use of robots in coding training. It has also been seen that students can develop creative thinking and problem-solving skills more easily and quickly (Numanoğlu & Keser, 2017).

Teaching coding to K12-level students improves computing thinking skills and is expected to increase university-level learning outcomes.(Mayer ve others,2013).

Patterson (2011) states that in 14 of the 19 research papers with his work, robot use in coding education has and will have a positive impact on students in the future.

In the research conducted by yüksekturk and Altiok(2015), the opinions of 25 teacher candidates in the third and fourth grade of Information Technologies regarding computer programming teaching were taken. They have been provided with an effective and accurate experience of new attitudes and tools that they can use in coding teaching. Positive statements have emerged about its post-event gains. Suggestions have also been made about similar activities.

As a result of research by Yadagiri, Krishnamoorthy and Kapila (2015), in recent years

robotics-coding has attracted great interest in various trainings. First, the use of robotics for formal and informal learning was studied. Second, students of both sexes are known to react positively to robotics. Third, there are numerous publications on this topic. The use of robotics for all grade levels, including Elementary, has been evaluated. These are elementary, middle school, high school, Bachelor's and master's degrees. Fourth, robotic coding can be used to support student learning, including a range of disciplines. For example, robotics competitions can be held to enrich graduate education.

In the research conducted by tümer and others(2018), 120 students at Konya Ereğli Science High School were given robotic coding training. After the training, 4006 TUBITAK projects were prepared and an exhibition was held. Discussions were held to determine the impact of TUBITAK 4006 projects on students. They found robotics coding fun, adopting group work. Also robotic coding students to increase their interest in class, problem-solving skills, improve creative thinking and innovation skills developed in the robotic and sensor by using arduino coding by increasing the skills to do students professional self-confidence has emerged.

Of the platforms built on coding, 40 were studied according to their different aspects. These editors were analyzed by comparison, and as a result, Scratch, code.org and app2inventor coding software has been shown to be more advanced with features and functions than other software. It has been seen that this software can be more useful to children's coding learning.(Baz,2018).

In this study, domestic and foreign academic studies related to the use of robots in coding education were searched. The articles reviewed aimed to reveal the benefits, necessities and harms of robotic coding as effects on students.

Conclusion

Students now and in the future, assessment in education, problem solving and a critical perspective developing, synthesizing, analyzing, design-oriented thinking, creative thinking and collaborative working skills is of great importance for you to earn. One of the ways to gain these skills to students is through teaching robotic coding training. Because coding education not only imparts information technology skills, but also helps students develop and accelerate problem solving, creative thinking, production and reasoning skills. (Akpınar ve Altun, 2014).

Students develop themselves in the subjects and applications they encounter at school through the teaching of robotic coding and enable them to achieve success in their future lives. Coding software designed for pre-school children is separated from complex code structures, allowing them to make fun applications that they can easily learn. These coding software have been prepared in accordance with both age groups

and developmental levels of children. Rather than teaching coding directly, the software aims to increase the motivations and interests of children who use and learn coding tools. Coding software is now ready for students to use from pre-school to university education(Baz, 2018).

Coding software and applications under development are currently based on certain age groups and levels, but teachers and parents have to teach the right software and coding for children.In addition, the main development areas of children are language, social, mental, novelistic, etc. they need to complete themselves in matters. It is important that these considerations are fulfilled by age and adapted to their peers. Before these important issues are fully fulfilled, it is seen that starting coding education will lead to children not being able to complete their development in many ways in the future. Buddha causes children to have a negative impact on their future.

There are also differences in coding software, mobile adaptation options, fees, language support and assistance support. These options make it compulsory to choose coding software by considering the age and readiness of the child.

As a result of the research, there are many positive effects on students about the use of robot in coding education in the scanned articles.These are;

- ✓ Learn programming easier and faster,
- ✓ They found it fun and embraced group work,
- ✓ Also, robotic coding increases students ' interest in class and school,
- ✓ Develop problem solving skills,
- ✓ Develop creative and innovation thinking abilities,
- ✓ Increased in-course motivations,
- ✓ Robotics using Arduino and sensor-enhances coding skills,
- ✓ It has been determined that it gives students professional self-confidence.
- ✓ Increased achievements in different courses,
- ✓ The working process in coding education allows students to look at the lessons from a different dimension.
- ✓ Children now experience his pleasure by producing something, and children who experience the dignity of this situation now feel different and privileged among their peers, etc. the consequences are emerging.

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