

ABSTRACT

The subject of the diploma thesis is the creation of a robotic tool for the development of algorithmic thinking for pupils of the 2nd grade of primary school and corresponding grades of multi-year grammar schools. The work is divided into a theoretical and a practical part.

In the theoretical part, digital technologies using 3D visualization and their application in the school environment are introduced. A greater emphasis is placed on the description of 3D printing technologies. After the introduction of digital technologies, the possibilities of implementing 3D printing and modeling in the teaching of selected subjects are analyzed within the framework of the RVP ZV revision. This is followed by a list of applications dealing with 3D modeling suitable for selected target groups of pupils.

The practical part provides a guide for assembling the robot and drafts of worksheets with ten algorithmic tasks, including solutions for educators. Also included are materials containing rules for building algorithms in the selected programming environment. Due to the mapping of the robot development process, the subsection presents a list of electronic components that can be used in the robot's production and justifies the selection of the chosen variants.

The next chapter focuses on the reflection of experimental verification, which was carried out at the Lovosice Gymnasium, specifically within the optional robotics seminar for second and third-grade students.

In the conclusion of the thesis, the fulfillment of the set goals is evaluated. There are worksheets and a manual for assembling the robot in the appendices of the thesis. As part of the practical application of the thesis, all outputs are shared through the GitHub platform.

KEY WORDS

3D modeling, 3D printing, robot, self-made robot, algorithmic tasks