

# **A Blended Learning Program Based on an Academic MOOC for Computer Science Education in Middle Schools**

Thesis for the Degree of

MSc

by

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Submitted to the Scientific Council of the

Weizmann Institute of Science

Rehovot, Israel

**October 2020**

## **Summary**

In an attempt to provide meaningful computer science education (CSE) to a broader range of K-12 students, this research developed and evaluated a blended learning program based on an academic MOOC. The program was designed to address critical challenges in expanding access to quality CSE, including lack of trained teachers, equality issues, and the need for agile curricula.

The program was piloted with 9th-grade students in two science track classes. Students successfully completed the academic-level MOOC, achieving scores on par with undergraduates. The structured blended learning approach was key, providing scaffolds for students while enabling the teacher to focus on orchestrating activities. Students developed a more accurate perception of computer science as a discipline. However, no significant effect was seen on motivation or views of CS careers.

While further research on scalability and training teachers is needed, the program shows promise in leveraging MOOC resources to deliver meaningful CSE to more students. Amidst the COVID-19 pandemic, the blended model proved flexible in shifting to remote learning. This highlights the potential of such programs to provide continuous, quality CSE despite crises disrupting traditional classrooms.

In conclusion, this preliminary study demonstrates an approach to deliver academic-level CSE to middle school students through a thoughtfully designed blended program. Further development and research could improve outcomes and scale impact. However, the initial results are promising for democratizing access to quality introductory computer science education.