High school physics lessons for students with physical disabilities

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MPTL Multimedia in Physics Teaching and Learning

E·L·T·E

MOZGÁSJAVÍTÓ EGYMI

Importance of inclusive education

- More and more children are entering education with special needs
- Everyone has the right to learn and develop
- Students can socialize best within their own age group

2 answers to the solution: a supportive but somewhat special needs-focused education

or

education without barriers for everyone

Challenges in Science Education

Science is becoming less popular

An even bigger challenge for the physically disabled (Limited access to experiments and hands-on learning)

Lack of adaptive teaching materials

Low engagement and interest in physics

How is physics different for physically disabled students?

Poor manipulation skills

Different perspective

Lack of experience (step if you've never walked)

Spatial vision problems

I can't do it feeling motivation loss effect

The Role of Multimedia in Inclusive Physics Teaching

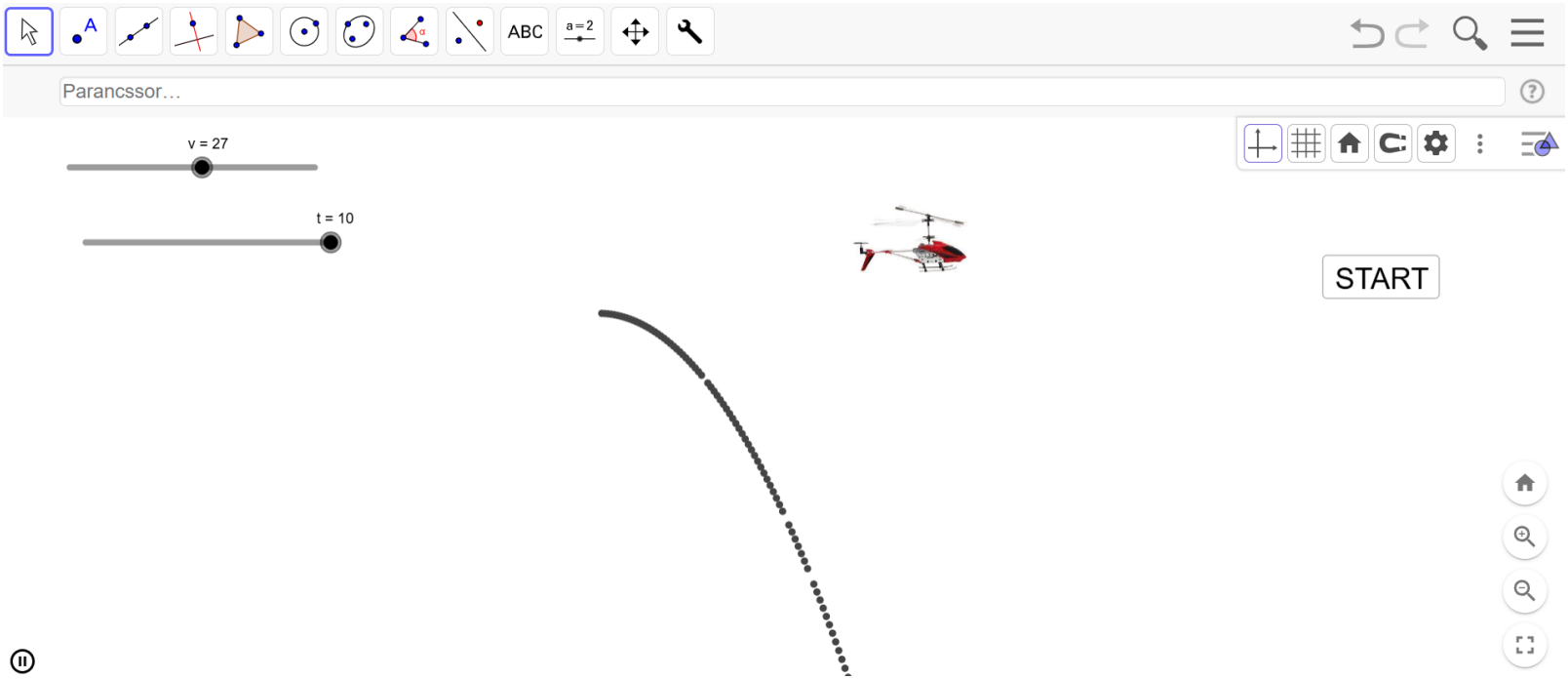
Simulations: Virtual labs and simulations that are accessible to students with physical disabilities or visual impairments

Using robots, microcontrollers and drones (trendy devices)

Alternative keyboards: Head mouse, stylus, and other specialized input devices that enable interaction with learning materials.

Online collaboration platforms: Digital environments that support teamwork and joint experimentation

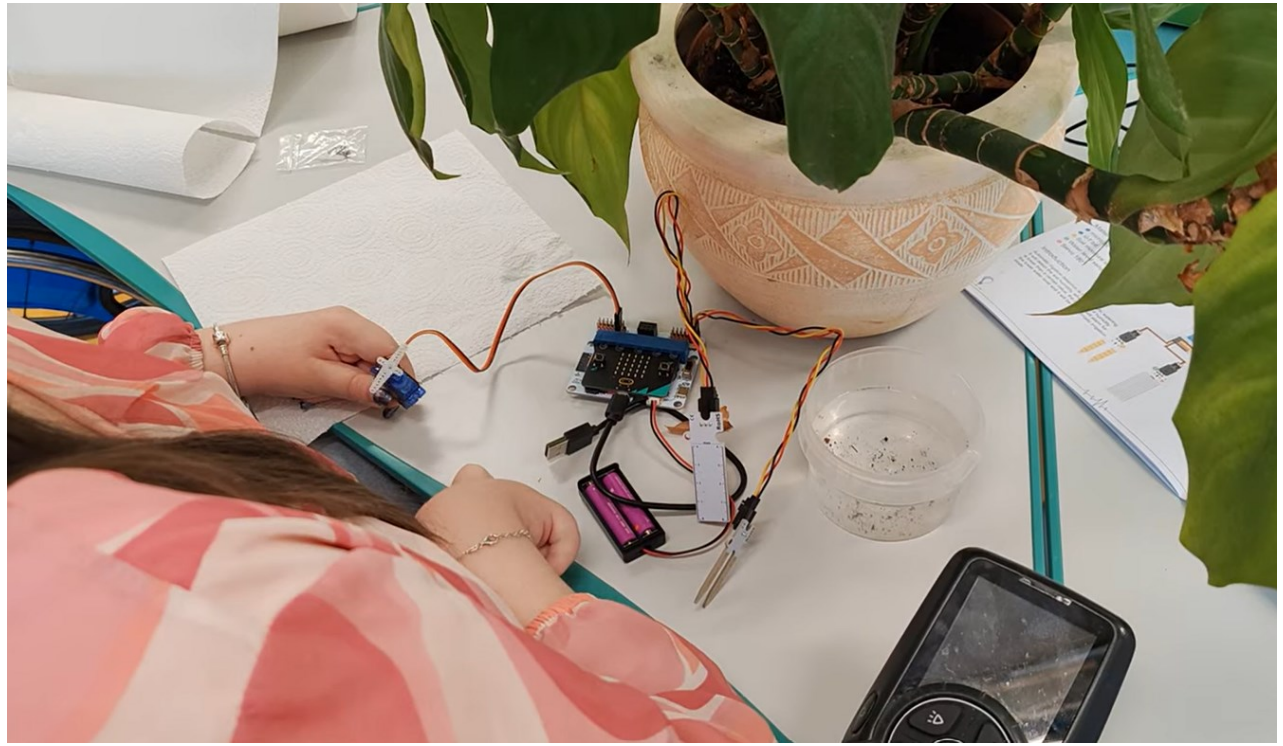
Digital motion tracking



SIMULATION OF HORIZONTAL PROJECTILE MOTION

Answers and solutions

What challenges and pedagogical responses arise in the education of students with physical disabilities?



- **STEAM and Maker Pedagogy**
- **Project-Based Learning (PBL) Approach**
- **Adaptive Experiments and Digital Tools**
- **CPS (Collaborativ Problem Solving): Integration of Digital and Social Competencies**

STEAM and Maker Pedagogy

- Integrating Science, Technology, Engineering, Arts, and Mathematics (STEAM)
- Using creative problem-solving to make physics more accessible
- Encouraging student participation in hands-on learning

Project-Based Learning (PBL) Approach

- Engaging students through real-world physics applications
- Connecting physics concepts to students' physical experiences
- Enhancing learning through problem-solving and collaboration

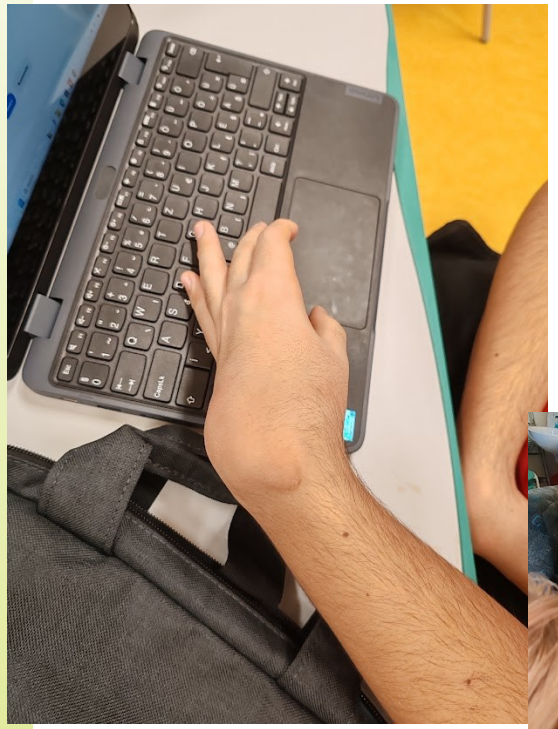
Adaptive Experiments and Digital Tools

- Examples of physics experiments adapted for students with physical disabilities
- Use of simulations, virtual labs (Less emphasis is placed on methods that ensure active participation, which are more advantageous)
- Leveraging digital tools to ensure accessibility

Social and Digital Competency Development

- Importance of communication and teamwork in physics projects
- Enhancing digital literacy for lifelong learning and career opportunities
- Strengthening social inclusion through collaborative learning

Student Engagement and Motivation

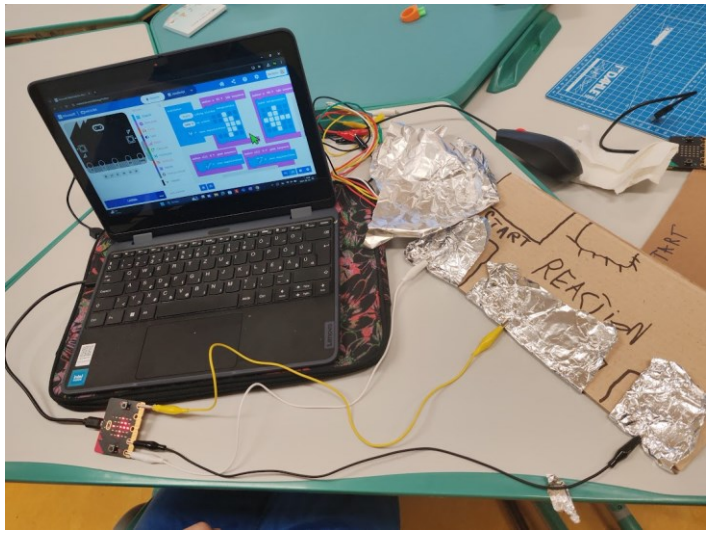


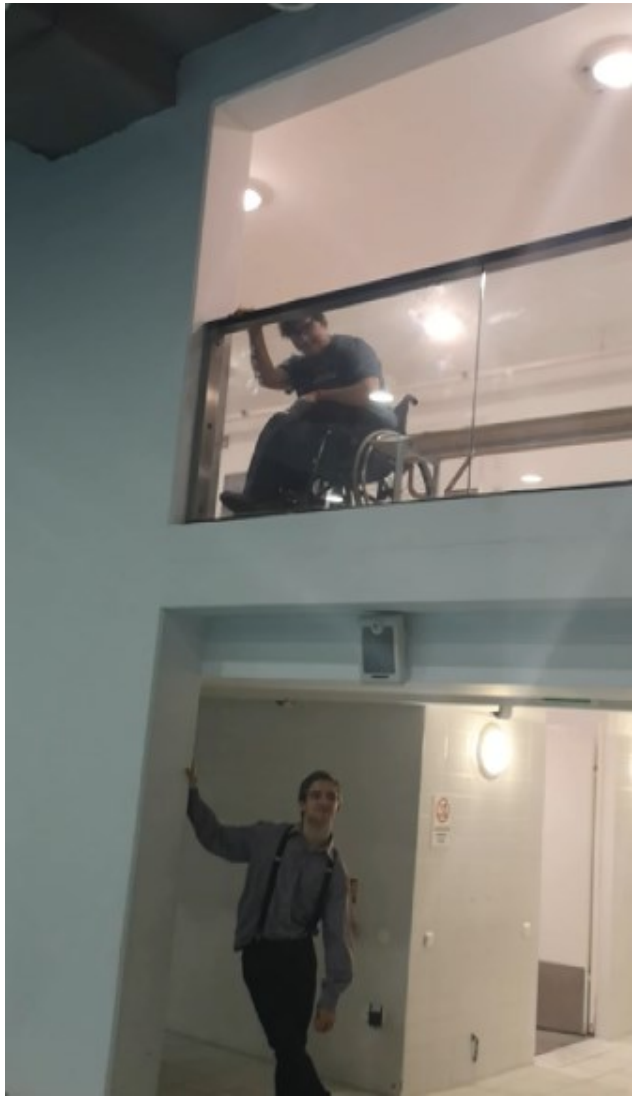
Real, based on personal experience and interactive lessons

Encouraging students to take an active role in their learning process

Making physics enjoyable and relevant to their experiences.

A Successful Project





The Benefits of Inclusive Physics Education

Increased engagement and interest in STEM fields

Improved confidence and social integration

Creating opportunities for future education and careers

Future Directions and Recommendations

The need for more teacher training in inclusive STEAM education

Expanding adaptive tools and digital learning opportunities

Ensuring continuous development of inclusive educational strategies

Conclusion & Q&A

Students with physical disabilities can learn physics effectively by changing the approach from individual support. These methods allow for active participation by anyone.

Thank you for your attention!

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Sources

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