

## EXTRA CURRICULAR ACTIVITIES IN TELEKI GYMNASIUM

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Education  
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PRESENTS THE PAPER ENTITLED

*Extra Curricula Activities in TELEKI  
Gymnasium (Budapest, Hungary)*



College professor

Physics teacher



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## **EXTRA CURRICULAR ACTIVITIES IN TELEKI GYMNASIUM**

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## EXTRA CURRICULAR ACTIVITIES IN TELEKI GYMNASIUM

### 1. INTRODUCTION

#### Well known problems

- education of natural sciences is still in crisis
- the popularity of "physics" has decreased worldwide (OECD: 2000, 2001 201, 2005, 2023)
- literacy and numeracy proficiency in our country is also continuously
- PISA results: 2022



	2006	2009	2012	2015	2018	2022
Science	504	503	494	477	481	486
Math	491	490	477	477	481	473
Literacy	482	494	488	470	476	473

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### 1. INTRODUCTION Drastically reduced nr. of Physics classes

Number of lessons in a week /grade ( part of the table)

Subjects	9 (age:14-15)	10	11	12
Hungarian	3	4	4	4
Mathematics	3	3	3	3
History	2	2	2	2
Chemistry	1	2		
<b>Physics</b>	<b>2</b>	<b>3</b>		
Biology	3	3		
Science		2		
<b>P.E. Sports</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>
Georaphy	2			

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### 2. AIM OF THE PROJECT

- to enhance students' motivation
- to popularize students' interest in Physics

**How:** ? with the following activities

- hands-on experiments
- study visits
- Physics shows
- performances
- non-formal educational activities



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### 3. HYPOTHESES

- **Hands-on activities** engage students to form useful scientific concepts
- **Exercises with real-life scenarios** bring our students closer to Science
- Study visits **rise up the students interest.**
- **The use of mobile devices** for experiments make the physics education more effective.



<https://phyphox.org/>

$$g = \frac{2 \cdot h}{t^2}$$



- Physics performances help students to understand better basic phenomena  
**OUR EXPECTATION:** students will be more interested and involved

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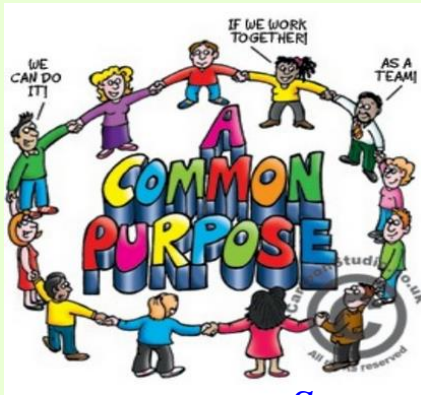
### 4. METHODOLOGY

The following methods was used during the project

- Inquired Based Learning**

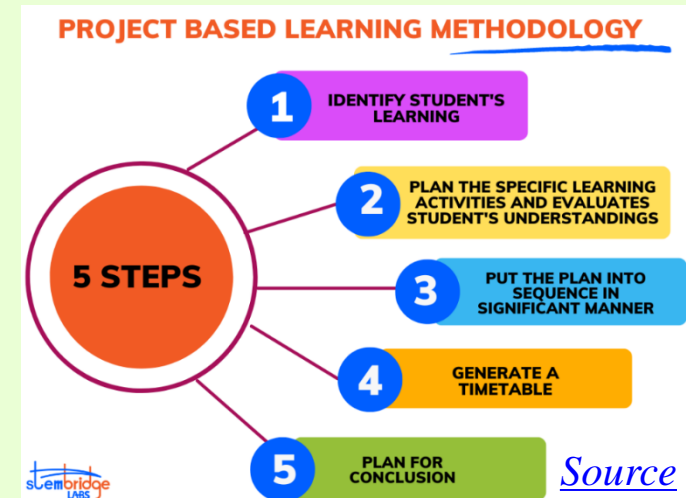


- Cooperative learning**



Source

- Project method**



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### 5. RECOMMENDATIONS

**Physics education will be more effective and students' competence will improve if students:**

- do experiments in pair, discuss the outcome, do some calc.
- learn how to use their mobile devices for measurements
- follow invited university lecturer's talk
- participate in professional courses (in school, at university)
- get involved in talent care activities: research work at university
- take part in study trips: SEMILAB, Paks Nuclear Power Plant,
- take part in project: Physics and music, Researchers' night, etc.

**See concrete examples what I did**



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### 6. EXAMPLE OF EXTRA-CURRICULAR ACTIVITIES

### EXPERIMENTS AND CALCULATIONS FOR MATURA EXAM (UNIQUE)



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**6. EXAMPLE OF EXTRA-CURRICULAR ACTIVITIES**

**EXPERIMENTS AND CALCULATIONS AT UNIVERSITY (UNIQUE)**



**List of small group measurements**

- Atomic nanowires
- **Holography**
- **Superconductivity**
- Ultrashort laser pulses
- Liquid crystals in polarized light - from LCD displays to malaria diagnosis
- From the photo effect to lasers and to quantum communication
- Control a nuclear reactor
- Semiconductor technology from the first transistor to the smartphone
- Measurements with a Michelson interferometer



Each group completed one measurement

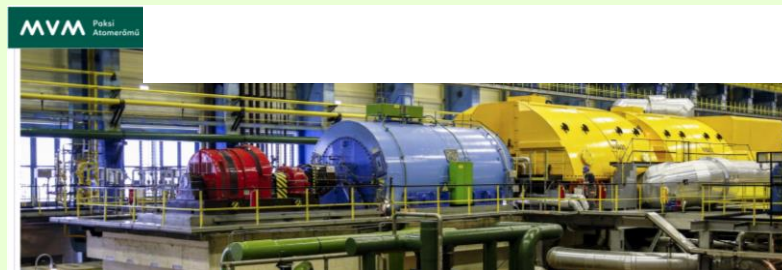
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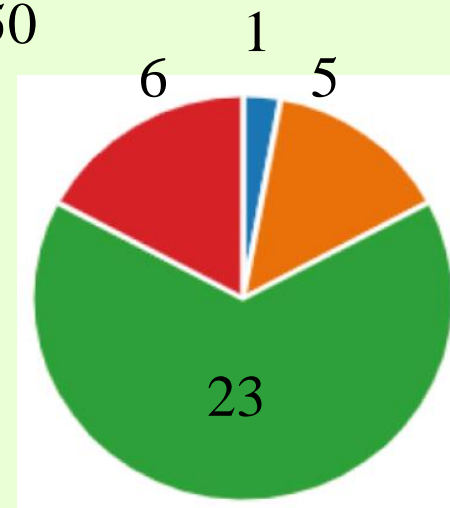
**6. EXAMPLE OF EXTRA-CURRICULAR ACTIVITIES**

**STUDY VISITS Paks Nuclear Power Plant**



Your opinion about characterization of nuclear power plants 28 answers from 50

- harmful
- non-renewable
- safe, important
- green



[Source](#)

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### 6. EXAMPLE OF EXTRA-CURRICULAR ACTIVITIES

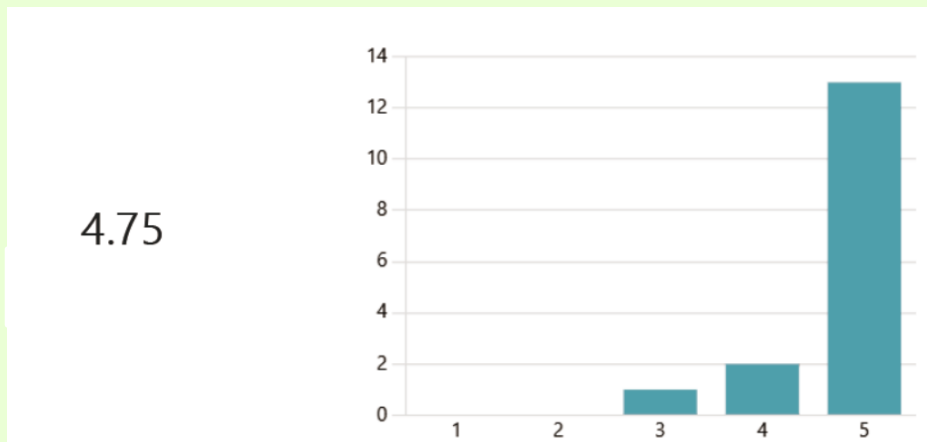
#### STUDY VISITS SEMILAB

the 5th biggest pure-play semiconductor metrology company



Feedback from students (scale: 0-5)

Have you been satisfied with the visit?



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**6. EXAMPLE OF EXTRA-CURRICULAR ACTIVITIES**

**STAGE PERFORMANCE - RESEARCHERS' NIGHT'S ACTIVITIES**



TELEKI BLANKA GIMNÁZIUM



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### 7. Conclusions

Applied research method – feedback, results

#### How to measure?

- Action research
- Interview - with students
- Questionnaire

**Extracurricular  
activities play a  
crucial role in  
maintaining and  
enhancing students'  
interest in STEM  
subjects**

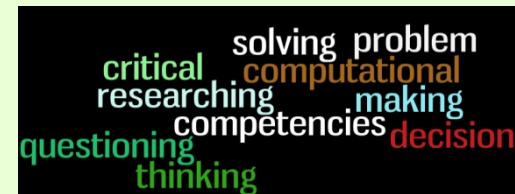
**The specific examples and answers support the hypotheses.**

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### 7. Conclusions

Students who had joined each activities

- took part in the activity with enthusiasm,
- Enjoyed the interactive activity,
- learned to make reflections,
- were motivated in problem solving, and thinking,
- used the advantages of cooperation,
- changed their concept related to frightening questions
- improved their core competencies



critical solving problem  
researching computational  
questioning competencies making  
thinking decision

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## EXTRA CURRICULAR ACTIVITIES IN TELEKI GYMNASIUM

### 8. References

- <https://eurydice.eacea.ec.europa.eu/national-education-systems/hungary/teaching-and-learning-general-secondary-education>
- „What is Cooperative Learning? - Definition & Methods Retrieved from <https://study.com/academy/lesson/what-is-cooperative-learning-definition-lesson-methods.html>.” 2015. Available: <https://study.com/academy/lesson/what-is-cooperative-learning-definition-lesson-methods.html>
- B. Jarosievitz, ICT and Multimedia in Physics Education, In: GIREP-ICPE-EPEC 2017 Conference, Dublin, Ireland, 2017, 26. p., 2017.
- B. Jarosievitz, The impact of ICT and multimedia used to flip the classroom (Physics lectures) via Smart phones and tablets, pp. 357-363. , 7 p.: In: Thoms, Lars-Jochen; Girwicz, Raimund Proceedings of the 20th International Conference on Multimedia in Physics Teaching and Learning, 2016.
- <https://www.youtube.com/watch?v=7JxJyY4plXc>

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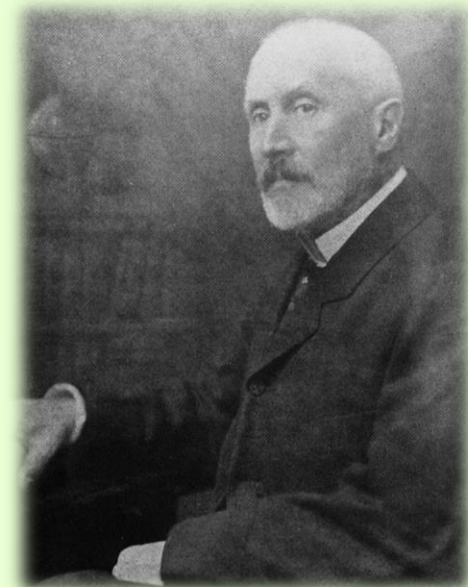
### 9. Acknowledgement

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*“Let us learn from each other so  
that we can teach better.”*

*(Loránd Eötvös)*



**Thank you for your attention!**