

The first two years of ISCED Level 3 education: which Physics?

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The project intends to test the idea of increasing the number of weekly lessons by implementing an alternative theme-based curriculum. It aims at developing relational, communicative and planning skills as well as encouraging creativity and innovation. Discovery learning, Challenge-lab and interdisciplinary teaching methodologies will be implemented.



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PER and the Teachers: a constructive interference?

At the Lyceum

- From 2 to 3 lessons/week.
- A critical overview of student learning.
- Teachers **asking for help**: LCSF and liceo scientifico «L. da Vinci» started working on curricula **together**.

LCSF proposal:
experience + PER +
the role of misconceptions

- ✓ Curriculum designing;
- ✓ *work in progress* training;
- ✓ support and supervision;
- ✓ experimentation;

- analysis;
- results. **to do**

Physics Education Research (PER)

- Amy C Rowat et al. 2014 Phys. Educ. 49 512
- Hufri et al. 2019 J. Phys.: Conf. Ser. 1317 012159
- ...

Results or single experiments



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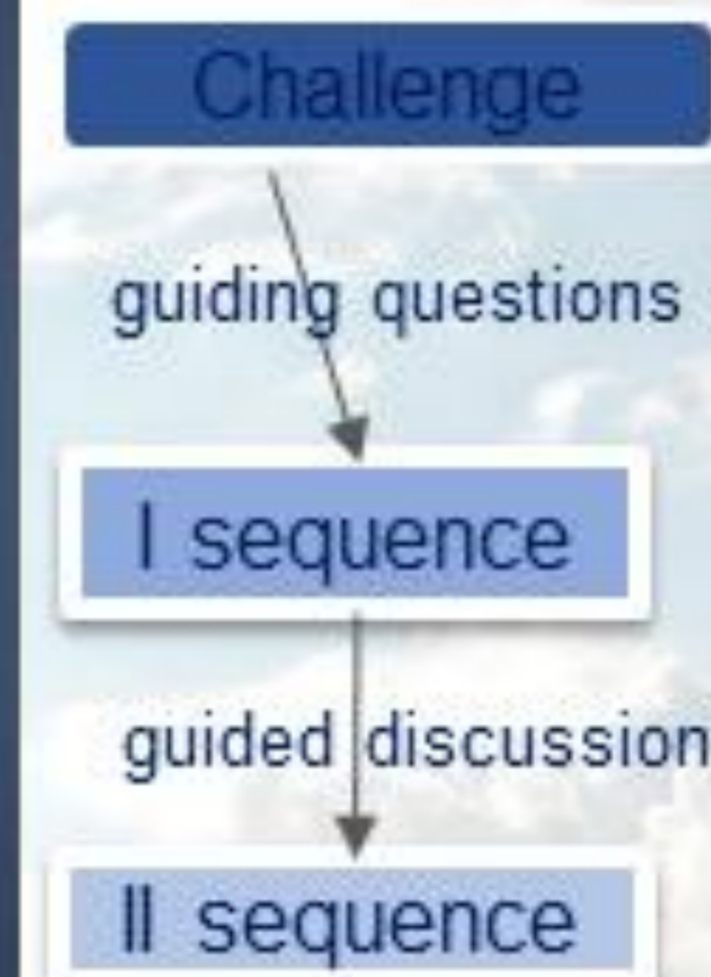


Techniques and Methods

Not-to-do list

- Physics by chapters;
- problem, procedure, solution: the "cookbook" nature of laboratory;
- *what equation am I supposed to use?*
- following closely the physics textbook.

Teacher/guide Student/active role



Challenge-Lab Approach
IBSE, PBL, TEAL

- ✓ Diagram.
- ✓ Topics and common misconceptions.
- ✓ Brief description of sequences.
- ✓ Suggested experiments.
- ✓ Suggested exercises.
- ✓ Tips.

Teaching-Learning Sequences (TLS) proposal

- Walk and run
- With your head in the clouds
- How do telescopes work? (designed by the teachers)



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Results and Conclusions

Strengths

- ✓ School - University collaboration.
- ✓ Meetings: great attendance
- ✓ Sharing of ideas.
- ✓ Designing TLS and Sci Lab
- ✓ Willingness to try new strategies.

Critical issues

- ✓ Many teachers still plan by content, according to textbook structure.
- ✓ Teachers tend to change slowly.

Constructive interference?
It is possible!

PER



Gradual changes

1. Trying new strategies
2. Designing open TLS according to PER and misconception studies
3. Improving the TLS and overcoming textbook structure



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