

# Formative approach in physics education

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**Abstract:** The workshop will offer participants the opportunity to familiarize themselves with several activities that support the formative approach in physics education. Drawing from the author's experience, both in working with teachers and in teaching at the secondary school level, the workshop aims to provide practical insights and tools for integrating formative methods into physics instruction.

## Introduction

The formative approach to teaching in all types of schools has been recommended worldwide for some time. In the Czech Republic, teachers have access to books that deal with this approach. Translated books by D. William [1], P. Ginnis [2], H. Fletcher-Wood [3], and others are available. These publications not only contain theoretical background but also offer many ideas for specific activities with students. Various seminars focused on the formative approach are also available in our country. However, teachers do not always have enough time to study professional literature and consider how to incorporate specific aspects into their teaching. Similarly, seminars often demonstrate activities suitable for primary education or language teaching, but rarely for other subjects.

Based on our experience, it is useful to show teachers the formative approach through very specific activities that can be directly applied in the classroom. Teachers after this experience often find that the approach is not far from their current practice and that "they are almost doing it, they just need to adjust their own activities slightly". We led workshops on this topic at the conference Heureka Workshops as part of the Heureka project [4, 5], seminars as part of the Elixir for Schools project [6], and so on.

## Content of the workshop

At the conference, we will present several activities directly applicable to physics education at secondary schools, which have been tested in teaching. The activities will focus on the following topics:

- Understanding of the topic by the student (we use these activities for topic, in which students typically have some misconceptions)
- Student responsibility of their own learning (they can choose the activity or level of tasks,...)
- Criteria-based assessment
- Summarization at the end of the topic (one example of these activities can be seen in fig. 1)
- Student self-assessment (For example, students evaluate their impression of the test, their success with specific questions, etc., and then compare this with the actual results after grading.)

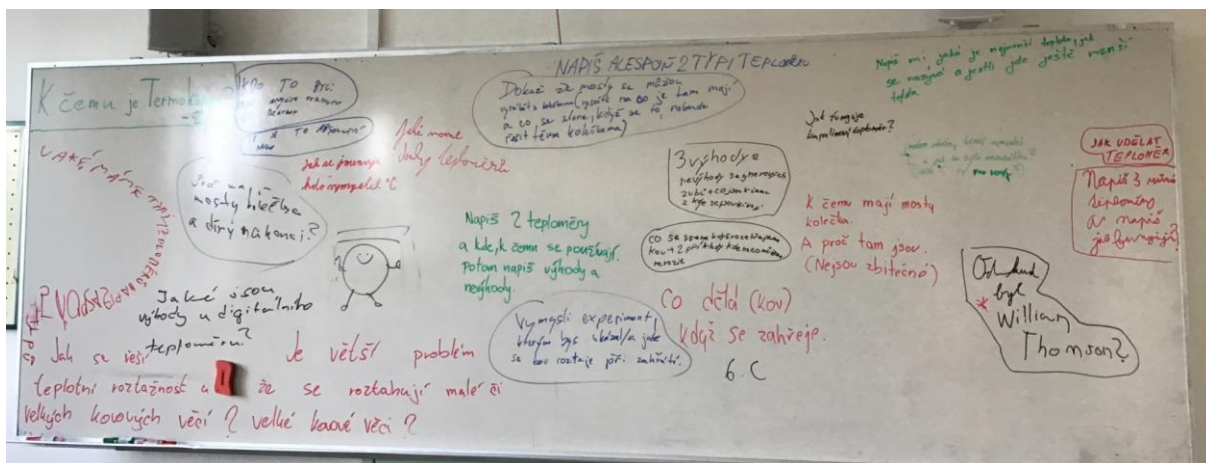


Fig. 1. Example of one activity: “Create questions which could be in the test”

Workshop participants will have the opportunity to try out some of the activities themselves, familiarize themselves with specific student work, and also discuss the advantages of the formative approach in teaching and the possibilities of using the offered activities in their own work.

## Conclusions

Based on the author's experience, teachers appreciate the activities described above because they are familiar to them and can be directly applied in their teaching. We believe that our experiences with the formative approach in physics education can serve as inspiration for other colleagues.

## References

- [1] D. Wiliam and S. Leahy, *Embedding Formative Assessment: Practical Techniques for K-12 Classrooms*, Learning Sciences International, 2015
- [2] P. Ginnis, *The Teacher's Toolkit*, Crown House Publishing Ltd, Carmarthen, 2002
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- [5] I. Dvořáková, Active Learning in the Heureka Project – Teachers in the Role of Students, *Scientia in Education* **8** (2017) 42-58. doi: 10.14712/18047106.731
- [6] Elixir to school. Available online: <<https://www.elixirdoskol.cz>>