INTEGRATION OF AI-TOOLS INTO A PHYSICS LABORATORY COURSE

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This paper presents the integration of AI-supported systems into a physics laboratory course at HTWG Konstanz in the summer semester 2025. The lab was conducted using the LabTeamCoaching approach [1]. Students were asked to use general-purpose AI models to prepare for the laboratory experiments. In addition, AI was used to provide feedback on students' lab reports before they were submitted to the instructor.

The focus is on two key moments in the LabTeamCoaching approach:

- *AI-supported preparation*: Can students prepare themselves for lab experiments just as well – or even better – with general-purpose AI models as with traditional textbooks?
- *AI feedback on lab reports*: Can an AI system automatically provide high-quality feedback that improves reports and supports learning processes without replacing instructors?

Survey results show active AI use by students, who largely perceive the use of AI as helpful. General-purpose AI models can provide valuable support in teaching without requiring specific customization or training – at least when dealing with topics that are already well represented in the AI models (such as classical physics topics). However, the availability of higher-quality, paid versions of AI models raises questions about educational equity and the development of AI literacy.

The paper presents details from the investigations regarding the implementation and objectives of the lab, the scope and intensity of AI use, as well as the results and conclusions drawn from the surveys. However, the study provides only an initial assessment, as no direct comparative study has been conducted.

[1] Jürgen Sum, Bernd Jödicke und Christian Hettich (2019). LAB-TEAM-COACHING A FLIPPED CLASSROOM TECHNIQUE FOR PHYSICS EXPERIMENTS. International Conference on Physics Teaching in Engineering Education PTEE.