

ICPE 2022 Special Issue (Part 4)

Special Issue Guest Editor:

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The International Conference on Physics Education 2022 was themed "Physics Education: Preparing for the Future." This special issue, contains six articles elaborating on presentations from the conference. What they share is the introduction of new methods and didactic approaches in the field of physics education, along with corresponding studies.

- In "The Use of Analogies by Future Physics Teachers in Conducting Supervised Internship Activities," F.W. Parma, M.H.A. Vieira, and R. Nardi aimed to investigate how future physics teachers employed analogies during a supervised internship.
- M. Shintsuruta, T. Iwayama, and H. Okubo provide an exciting insight into physics education research (PER) in the field of electricity. In Japan, the shape dependence of electrical resistance is effectively taught in senior high schools. The authors present design and practice lessons that illustrate and help students understand the concept.
- Escape rooms are playing an increasingly important role as a leisure activity for teenagers (and adults). T. Sukelová and K. Velmovská address the motivational aspect of escape rooms and integrate it into the learning of physics. Their article impressively demonstrates that a forward-looking physics education must explore new paths to be both engaging and effective!
- "A Study of Grade Eleven Students' Representations of Electricity Through Model-Based Inquiry" by W. Boonmak and J. Huntula arises from the conditions prevailing during COVID-19. The pandemic forced schools to close and transition to online learning. The authors from Thailand researched whether students achieve a higher level of representation after learning via an online learning platform through the Model-Based Inquiry (MBI) method and how they can be supported. In the context of physics, this study once again pertains to the topic area of electricity.
- Physics education takes place all over the world. Thus, "The Use of Research Findings by Undergraduate Physics Education Programs in Angola" enriches the previously presented studies with insights from Africa. The authors, J. Oliveira and R. Nardi, present the findings of a pilot study that aimed to determine whether scholarly literature—such as journal articles, monographs, dissertations, and theses—is considered in the education of physics teachers in Angola.
- Finally, E. Blanquet and D. Hennequin from France present "Identifying First-Year Science Students' Difficulties: Results From The Online French Physical Society Questionnaire," a large-scale study involving 5,891 first-year science students from various French tertiary education tracks (universities, preparatory classes for engineering schools, technological university institutes, etc.) conducted over nine years. The goal was to document the understanding of physics concepts and the mastery of basic mathematical tools after completion of the baccalauréat (French high school exit examination).

The articles vividly demonstrate how new paths are being pursued internationally to modernize, enhance, and future-proof the teaching and learning of physics. They also highlight the necessity of physics education research to make informed statements about the effectiveness of these new approaches.

I would like to thank all the authors and their teams for their inspiring insights into new paths and scientific investigations. May these contributions encourage many educators worldwide to embark on the path toward a future-oriented physics education!