

# INTRODUCTION

## A Third Special Section on the ASEE/AIChE Chemical Engineering Summer School

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### CHEMICAL ENGINEERING SUMMER SCHOOL IN CEE

The response to the Call for Papers from the 2022 Chemical Engineering Summer School (ChESS) was phenomenal, with a number of submissions coming from our workshop presenters and also from our newest Summer School attendees. Over the past several months, the editorial team has worked with both groups to publish 22 articles to date. The special section publications began with the Fall 2023 issue,<sup>[1]</sup> continued with the Winter 2024 issue,<sup>[2]</sup> and now conclude with the Spring 2024 issue. The number of papers resulting from the Summer School and the dedication of the authors wishing to disseminate their work broadly demonstrates the positive impact that both CEE and the Summer School have on the chemical engineering education community. Moving forward, CEE will continue to support new and established authors in highlighting their educational scholarship.

### PAPERS

This issue contains seven papers from the Summer School — six from attendees and one from the Summer School Organizing Committee. From the attendees, in “Mixed Reality in Chemical Engineering Education — A Proof of Concept,” Keisha Antoine, Lealon Martin, and Jorge Gabitto describe the development and evaluation of a mixed reality tool to engage student groups in the classic friction in pipe flow experiment from a unit operations laboratory. Michael Howard and Symone Alexander describe the use of a virtual-reality simulation to engage students in 3D representations to support first-year engineering student learning of nanoscale thermodynamic

phases in “Using A Virtual-Reality Activity to Enrich Nanoscale Concepts in Chemical Engineering.” In the paper “Photovoice: Visualizing the Experiences and Assets of Engineering Students,” Abdulmaliq Abdulsalam, Brian McGowan, Kristin Schaefer, Joan Wawire, and Jerrod Henderson describe the use of a novel, collaborative methodology that incorporates images and narration to empower students to share



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about their sophomore engineering experiences. Carlos Landaverde-Alvarado uses problem-based and project-based learning in two required labs — a junior lab on measurement, control, and data analytics and a senior lab on chemical engineering processes and products. Students' perceptions from close-ended surveys and open-ended written responses of the changes were positive in "Problem-Based Learning (PBL) and Project-Based Learning (PjBL) in a Continuously Improving Chemical Engineering Laboratory Experience." In "Cultivating an Entrepreneurial Mindset in Chemical Engineering Undergraduates Through Course Projects," Timothy Shenk and Nian Liu employ open-ended problems that prompt students to assess the marketability of their solutions while addressing technical challenges, fostering the creation of value for products they might not have initially considered to support entrepreneurial mindsets. Mohammad Heshmati and W. David Purvis report student and alumni perceptions of real-world versus simulated datasets for use in senior capstone design in "Three Real-World Oil and Gas Datasets for Petroleum Engineering Capstone Design with Applications for Chemical Engineering Design." The results indicate a preference for real-world data while acknowledging the learning curve in dealing with large and complex datasets.

Finally, the 2022 ChESS Organizing Committee members Margot Vigeant, Daniel Anastasio, Daniel Burkey, Michael Barankin, Taryn Bayles, Laura Ford, Tracy Gardner, Milo Koretsky, Daniel Lepek, and Matthew Liberatore provide a more extensive history and reflection on the organization and outcomes of the 2022 event in "Reflections and Assessment of the 2022 Chemical Engineering Summer School." The 2022 ChESS was evaluated with two surveys with both close-ended and open-ended questions — one administered at the end of the event, and one administered at the end of the following academic year. This final paper provides a strong conclusion to this set of special section papers on the value of the ChESS for the chemical engineering education community and opportunities to add additional topics and supports for attendees at future events.

## REFERENCES

1. Koretsky M, Burkey D, and Godwin A (2023) Introduction to a special section on the 2022 ASEE/AICHE Chemical Engineering Summer School. *Chem. Eng. Ed.* 57(4): 166-168. <https://doi.org/10.18260/2-1-370.660-134568>
2. Burkey D, Godwin, A, and Koretsky MD (2024) A second special section on the ASEE/AICHE Chemical Engineering Summer School. *Chem. Eng. Ed.* 58(1): 10-11. <https://doi.org/10.18260/2-1-370.660-135005>. □