



Abstract

The Chemical Engineering sophomore sequence concludes with a summative project requiring lab experiments, theoretical simulations, and preparation of a technical report. Modifications were made to require more intensive writing and analysis with feedback provided prior to the final report. The modifications resulted in improvements to the reports, including improvements in data analysis.

Background

- 4th and summative course in sophomore sequence
- Provides open-ended pilot scale distillation lab experience to 83 sophomores (teams of 3-4)
- Project includes theoretical simulation, data collection, analysis and writing (15% of grade)
- Project reports in previous years had particularly poor data analysis and explanation of results
- Technical writing quite good

Project Goals/Objectives

- Improve student ability to present and compare measured data and theoretical simulations
- Improve student understanding of distillation of a non-ideal solution under non-ideal, non-steady state conditions

Methods/Process

- Modify pre-lab submittal requirement:
 - ❖ Require walk-through with TA to verbally obtain operating instructions
 - ❖ Prepare written draft operating procedures
 - ❖ Specified expectation that they will modify methods based on comments and actual run experience
 - ❖ Prepare draft simulation of results for their operating conditions
 - ❖ Provide written comments on pre-lab prior to experiment
- Prepare and provide resource guide
 - ❖ Provide additional instruction on using the simulation software to permit more time doing simulation, less time learning software
 - ❖ Provide specific examples on appropriate data presentation and analysis

Results/Outcomes

- Results still under review
- Average project grade increased from B to A-
- Low grade increased from C- to B-
- More than 80% of teams submitted strong methodologies in their final report
- Appropriate presentation and comparison of data and simulation results increased from zero to approximately 33%



Conclusions/Recommendations

- Modifications identified above improved student outcomes and presumably improved student learning
- Additional efforts needed to further improve understanding of data analysis
- Consider introduction of this type of data presentation and analysis earlier in curriculum