

Advanced Individualized Take Home Exercises and Exams in Process Engineering (AdITHEE)

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Background

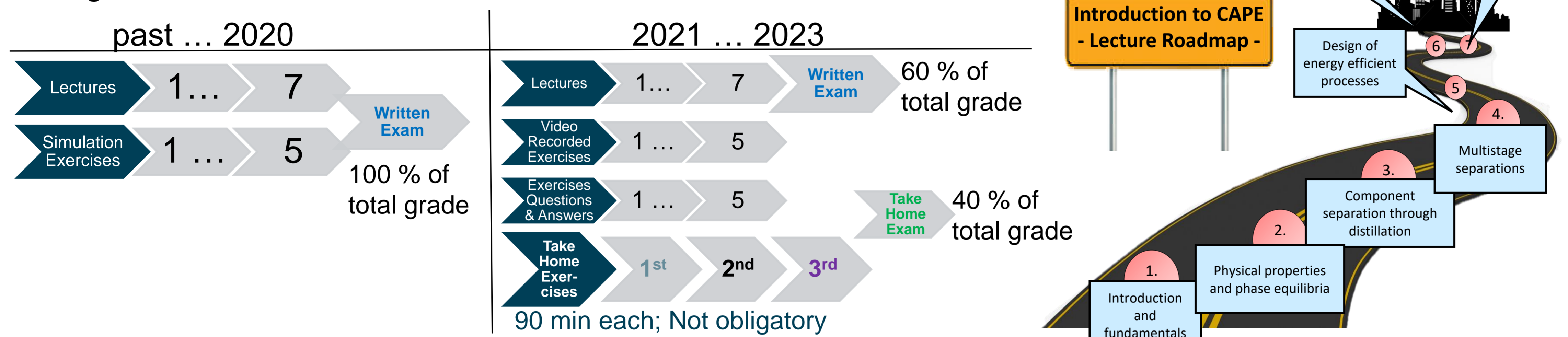
- Mode and way of student examination must reflect aimed qualification targets.
- Problem: Digital evaluation strategies for process simulation didn't exist. [1] Individualization of flowsheet simulation tasks for larger classes is challenging [2] and reliability and validity requirements must be met. [3]
- Development and implementation of **Take-Home Exercises and Exams (THEE)** [4] for examination under COVID-19 pandemic conditions.
- Successful application of THEE in the graduate course **Computer Aided Process Engineering I (CAPE I)** for independent learning [5]
- Further potential for improvement by bringing in external expertise and more resources.

Goals

- Prepare students for digital and international workflows in process design.
- Establish long-term digitalization in Computer Aided Process Engineering teaching.
- Implement flexible digital exercises, optimized for international students' self-study needs.
- Exchange with other teachers to expand our teaching competences and to identify synergy effects.
- Enable the linkage of digital teaching and examination content to provide students with specialized and interdisciplinary knowledge for their future professional field.

Restructuring of the course CAPE 1

Integration of THEE in the curriculum.

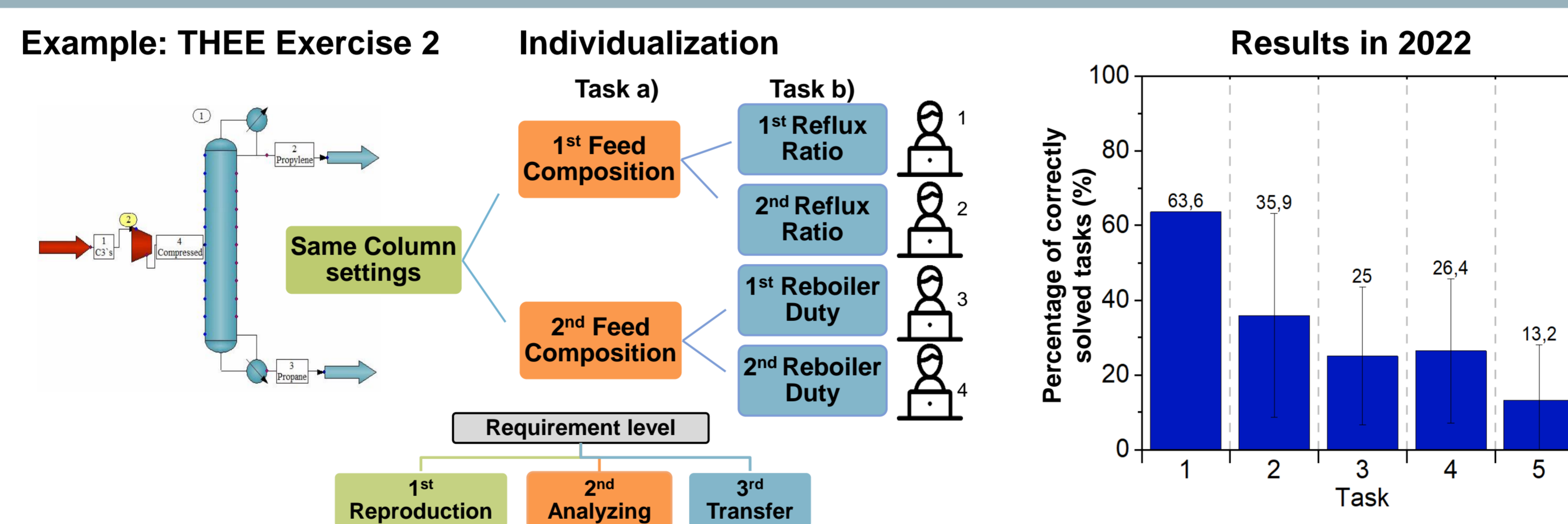


Student Feedback

- "THEE helped deepen my understanding of the course material"
- "It was a good way of finding out how well you could use elements of the lectures in practical ways"
- "I definitely practiced more than I would have, if the tasks were voluntary homework"
- "I like the possibility of taking an exam at home with the computer to which we are already accustomed"

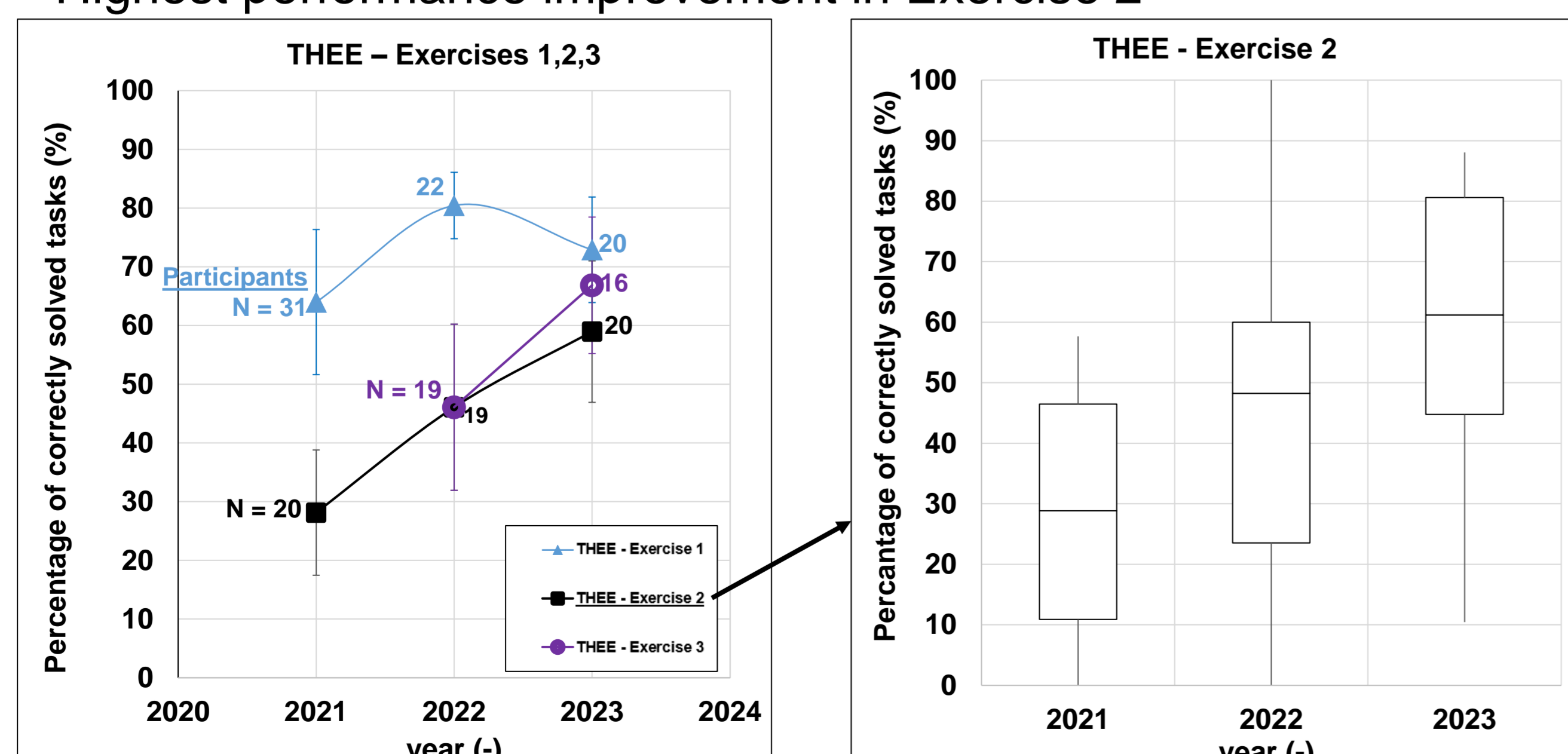
Design of THEE tasks

- Individualized tasks
- Comparable tasks
- Equal levels of difficulty
- Flexible level of difficulty



Evaluation: Exercises

- Reusage of Exercise tasks → performance is comparable
- Highest performance improvement in Exercise 2



Challenges and reflection

- Instructional video concepts and their subsequent realization is very time-consuming.
- Changes to improve teaching in ongoing semesters require significantly more coordination.
- The support and input we received during the project funding period has significantly improved our teaching program.
- Great project and a lot of fun!

Summary

Integration of THEE into the curriculum:

- Resulted in an increased number of participants in simulation exercises.
- Allowed for interim assessment of students to support the teaching goal.
- Improved combination of teaching and examination content.

References

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