Use of Syllabi to Determine Changes in the Facilitation of Learning in Engineering

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Background

- An impactful factor of educational reform is faculty members' willingness to incorporate active learning opportunities in their courses[1].
- Despite a need for adaptability in engineering education, research has found limited adoption of research-based educational strategies at the undergraduate level[2,3].
- COVID-19 was recognized as a disruptive event that required instructional changes in engineering teaching practices.
- Syllabi were identified as useful classroom artifacts for deducing course activities[4].

Research Questions

- Was the Course Change Typology sensitive enough to detect changes in course activities over time?

- How do course activities, as they are presented in syllabi, change from 2019 to 2023?

Methods

- The Course Change Typology was used to deductively code syllabi from 2nd and 3rd year spring courses in one UNL College of Engineering department.
  - 93 syllabi
  - 39 unique instructors
  - Spring 2019 – Spring 2023
- A subset of codes were used to identify changes in active learning opportunities.

Table 1. Definitions of Course Change Typology Codes

Code	Definition	Level
OutClass_GrpAssign	Short duration assignments that involve group work	0: Not present / 1: Present
InClass_GrpAct	Activities conducted in class that involve group work (e.g., in-class problem solving, NOT teamwork (longer duration))	0: Not present / 1: Present
InClass_StuActivity	Non-tech based student activities (e.g., minute papers, muddiest points, class reflection, self-grading, etc)	Count types
TeamProject	Long duration assignments with ongoing activity among team members	0: Not present / 1: Present
ActVariety	(e.g., projects, papers, homework, discussion board) NOT quizzes, exam, participation/attendance	Count types

Results
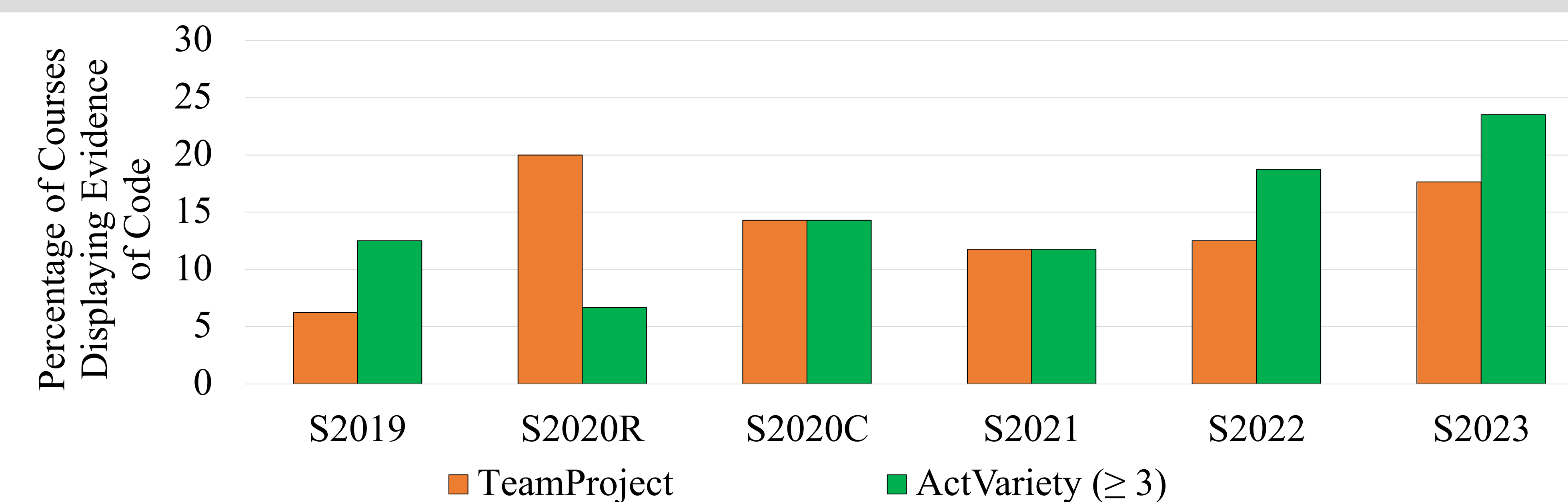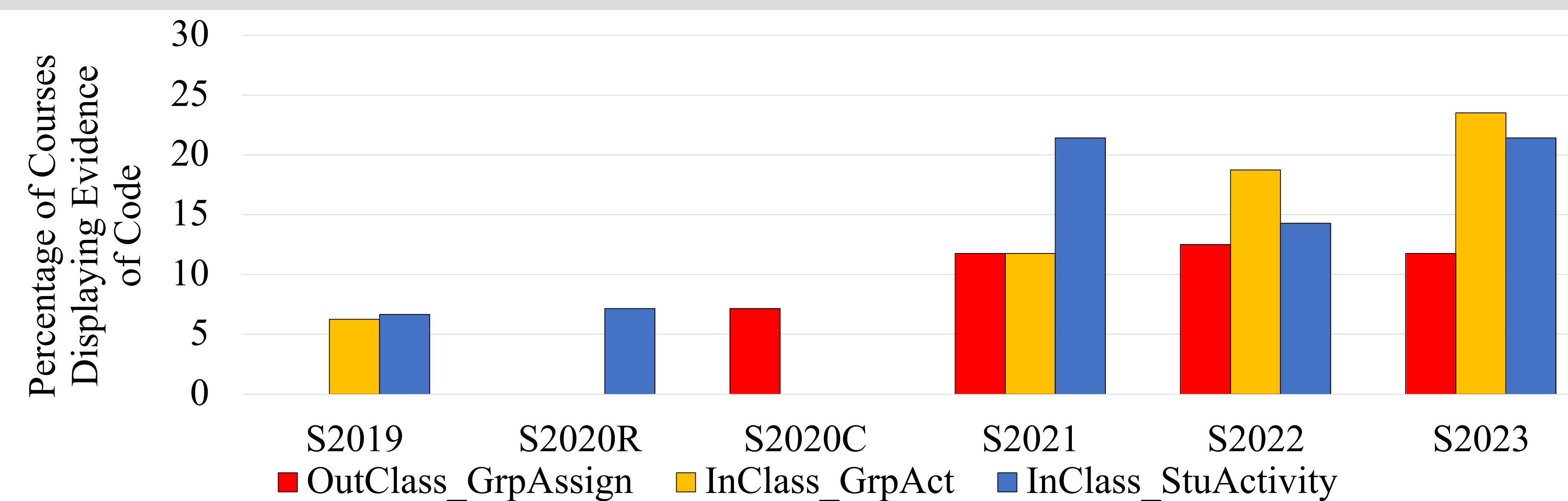
Key Findings & Conclusion

- The Course Change Typology detected changes in course activities from syllabi.
- After the initial drop due to COVID-19, in-class group assignments increased during the following semesters, peaking at 24% in 2023.
- Long-term team projects were most present in the 2020 pre-COVID spring semester before decreasing from 2020 to 2021 and then increasing again from 2021 to 2023, but still remaining below pre-COVID levels.
- Engineering courses saw an increase in the presence of active learning opportunities following COVID-19.

References

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