

# Helping students to start a project

Rafael Corsi Ferrão (Insper), Mariana Silva (UIUC), Rodolfo Azevedo (Unicamp)

# Insper

A small private non-profit institution in São Paulo, Brazil

Scholarships + stipends for 10-15% of students

Cohort-based (no courses outside of major)

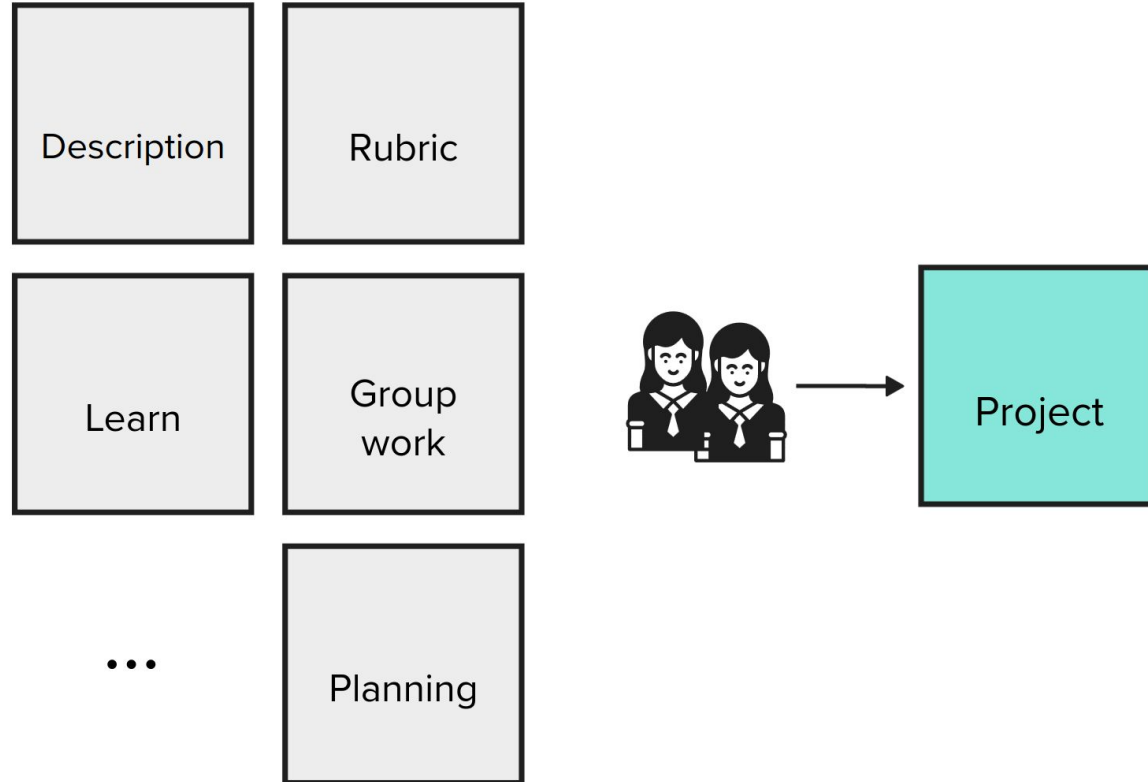
Enrollment: 50 students per semester



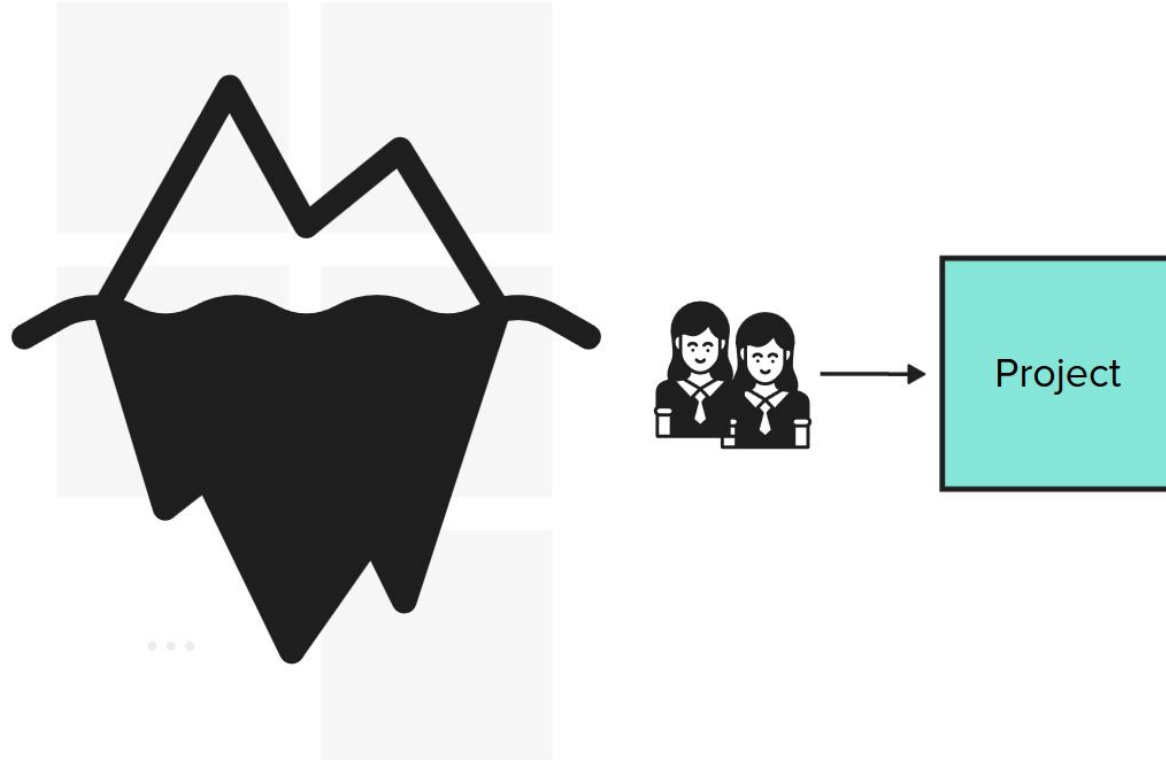
# Starting a project is hard

- **Uncertainty and Ambiguity**
  - Many unknowns and unclear objectives
- **Planning and Organization**
  - Requires thorough research and detailed planning
- **Skill and Knowledge Gaps**
  - May need new skills or knowledge
- **Motivation and Commitment**
  - Keeping motivation high can be challenging

If an expert struggles, imagine the challenge for a novice!

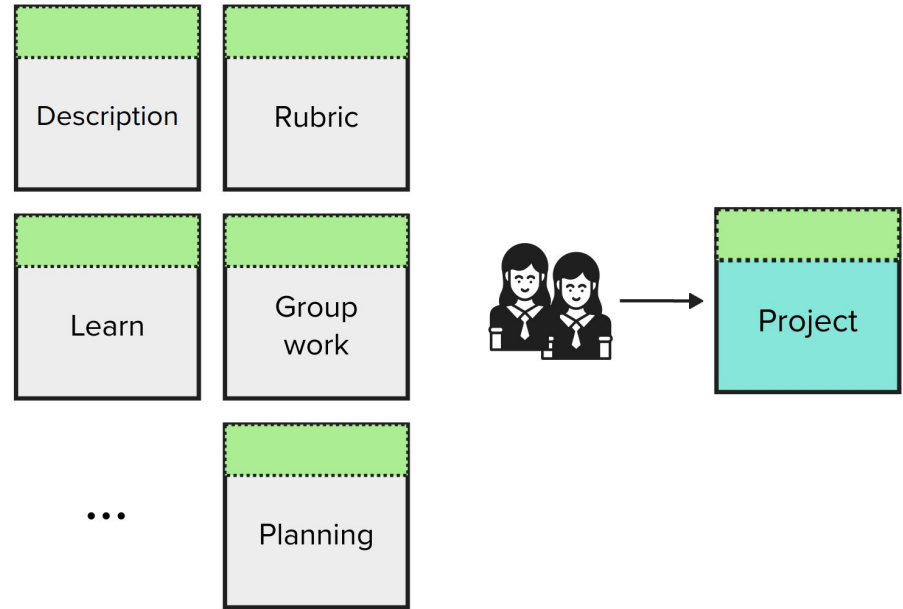


And there is much more that we do not count



# Solution: breaking part of the problem into tasks

Goal: Reduce the number of "Teacher, what do I have to do?" questions.



# Context

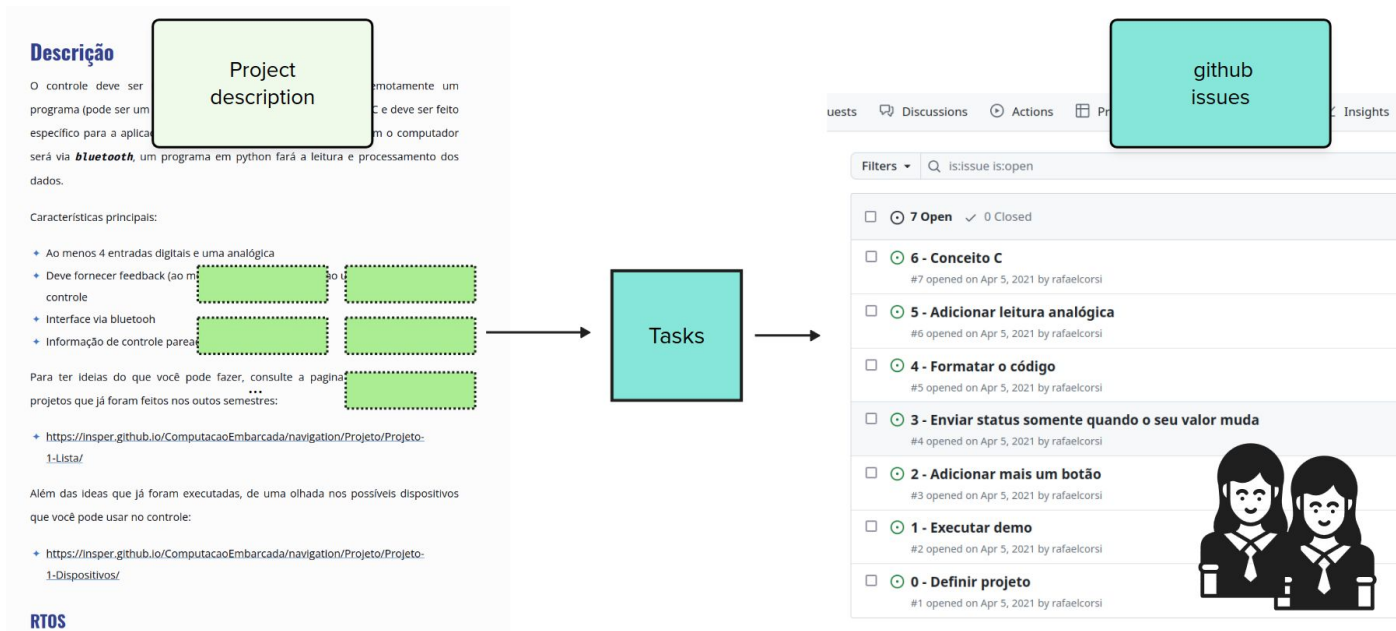
## Embedded Systems

- Undergrad course
- Offered in the fifth semester of CE
- Hands on

**Software**  $\longleftrightarrow$  **Design**  $\longleftrightarrow$  **Hardware**

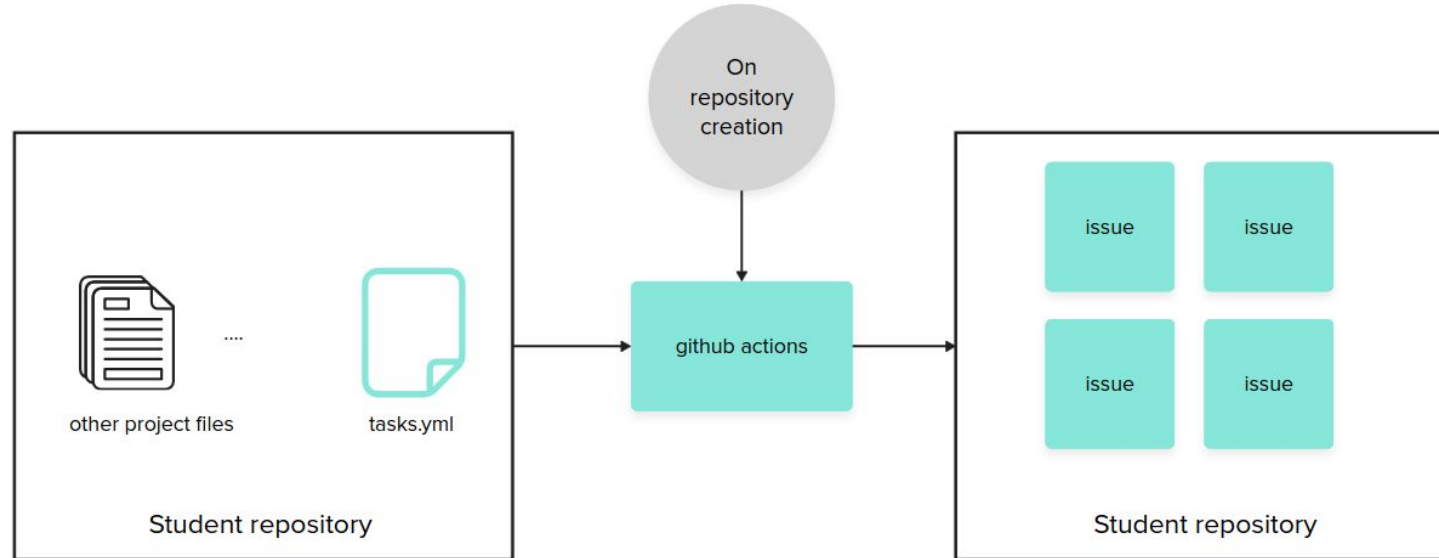


# Our approach





# Integrated with github workflow

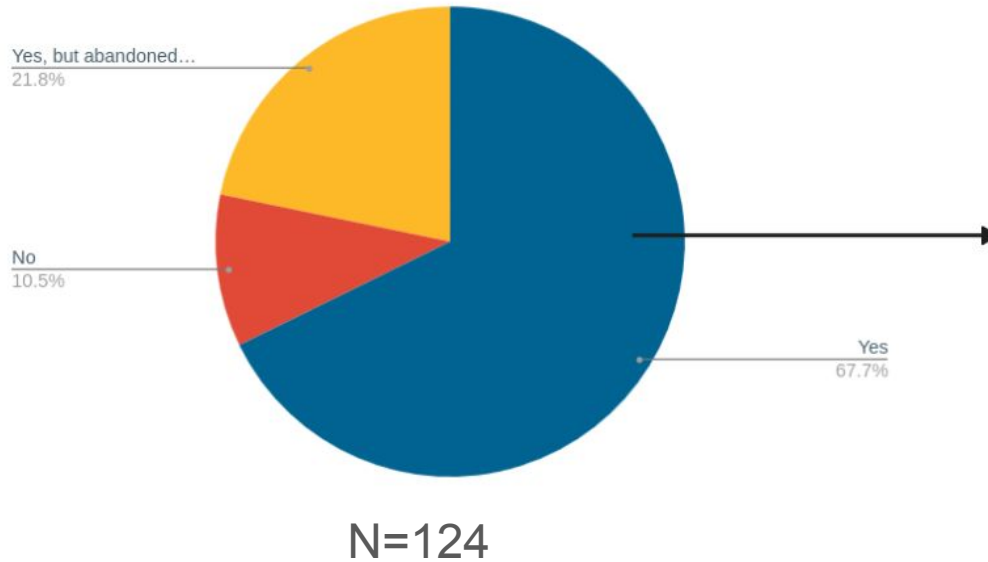


# Methodology

- Students choose whether or not to follow the tasks (no penalty)
- 124 projects / 260 students from 2 projects over 3 semesters (2022 - 2023)
- At the end of the projects, the students answered a questionnaire about project development
- We analyze git commit data

# Results - big picture

Are students using the tasks?



Likert scale full agree

"Are the tasks guided towards project development?"

91%

"Do you understand how tasks were associated with the project?"

95%

"Was the difficulty of the issues gradually increased?"

72%

28%

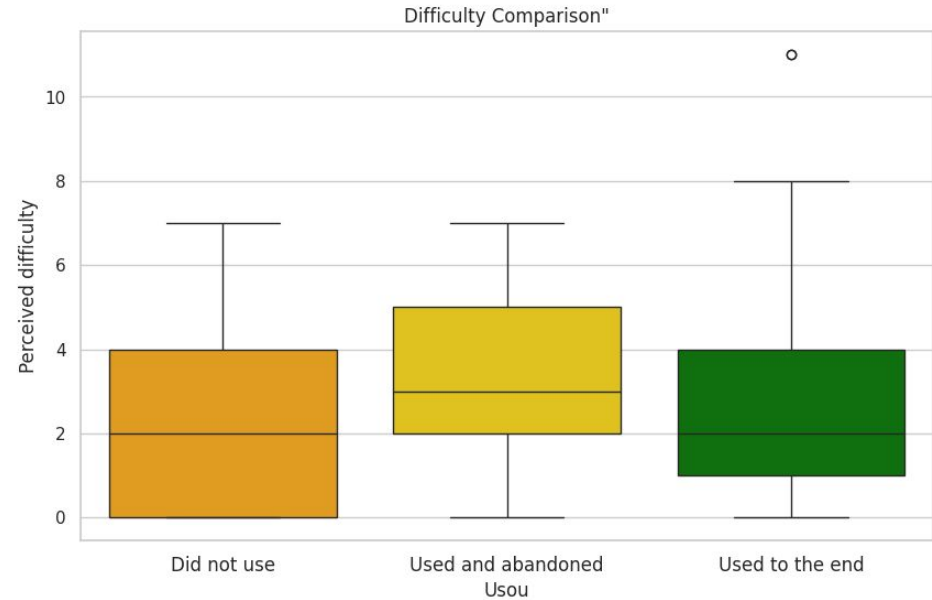
# Results - project perceptive difficulty

For each project we ask to students to scale several difficulties that we understand that is part of the project.

Mean

- **Used to the end:** 2.8
- Used and abandoned: 3.2
- Did not use: 3.0

There is no statistically significant difference in perceived difficulty among the different groups.



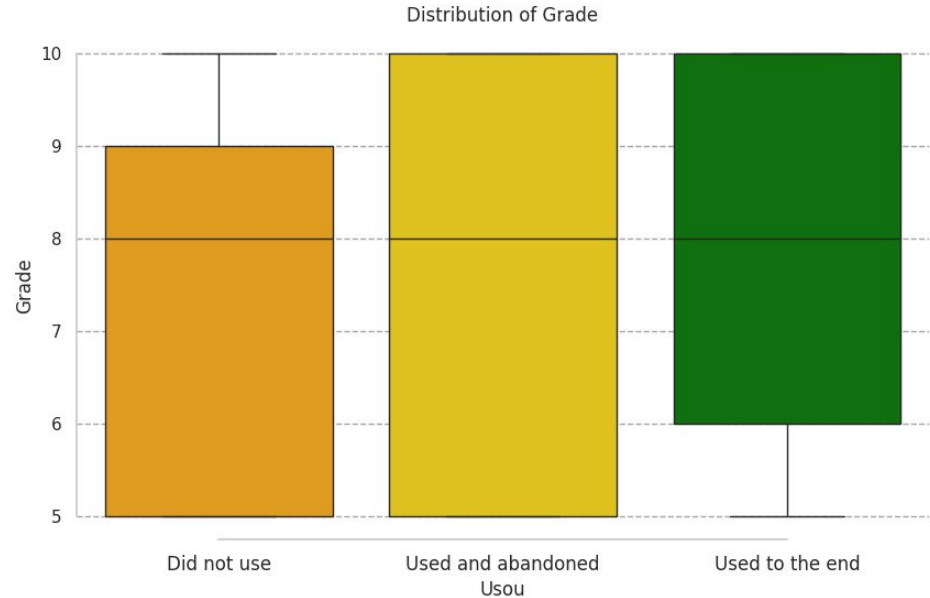
# Results - final grades

Is there a difference in the final grades?

Mean

- **Used to the end:** 7.5
- Used and abandoned: 7.3
- Did not use: 7.1

There is no statistically significant difference in final grade



# Results - other data

- 83% of students keep using the tasks from project 1 to project 2
- Number of commits increase between groups

Mean

- **Used to the end:** 13.9
- Used and abandoned: 5.0
- Did not use: 2.0

- Students ask for issues for upcoming projects

# Discussion

How to specify the tasks and create independence?

- Students stop reading project documentation.

*Student: "We feel that the issues were straightforward and helped with planning. The only comment is that it would be convenient if the tasks were up to the C grade."*

- Gather data from the beginning of the project
- Interview students to better understand why they abandoned

# Conclusion

Breaking a part of the project into tasks does help students, but there is no final impact. However, we see that the class starts the project more easily, and we have less difficulty managing this beginning phase.

Rafael Corsi Ferrão (Insper), Mariana Silva (UIUC), Rodolfo Azevedo (Unicamp)

- [rafael.corsi@insper.edu.br](mailto:rafael.corsi@insper.edu.br)
- [github.com/rafaelcorsi](https://github.com/rafaelcorsi)