



Learning Sustainable Construction Principles by Building a Learning-Game

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Objective of this presentation

- Share and discuss my teaching experience at Fundaments of Construction Sustainability course.
- Learn with your experience.



Background

- Fundamentals of Sustainable Construction course belonged to a Heritage Conservation Degree.
- Although it was in the Civil Engineering Department it was not for engineers.
- Many students didn't come from highschool from the engineering área.
- Those were very motivated students.
- 11 students at the course.



Built Heritage Conservation degree

3 years (bachelor)

3 years
(degree)

Fundamentals of
Sustainable Construction



Motivation

- First time I was teacher at that course.
- First time the course works.
- I love games and try to use them in the learning/teaching process.
- Try to make something useful in the classes.
- Increase awareness to construction sustainability in society.



Objective

Create a game about sustainable construction for students of basic school

- Learn about sustainable construction.
- Increase knowledge and interest about sustainable construction in society.





GAME DEVELOPMENT

Game development

- Students have some classes.
- Students seek additional information by themselves.
- Develop a game a game that by playing you learn about sustainable construction.
- Two teams – each team develop a diferente game
- Game tested at university
- Game tested with high school students
- Students made a writen report about the game contents



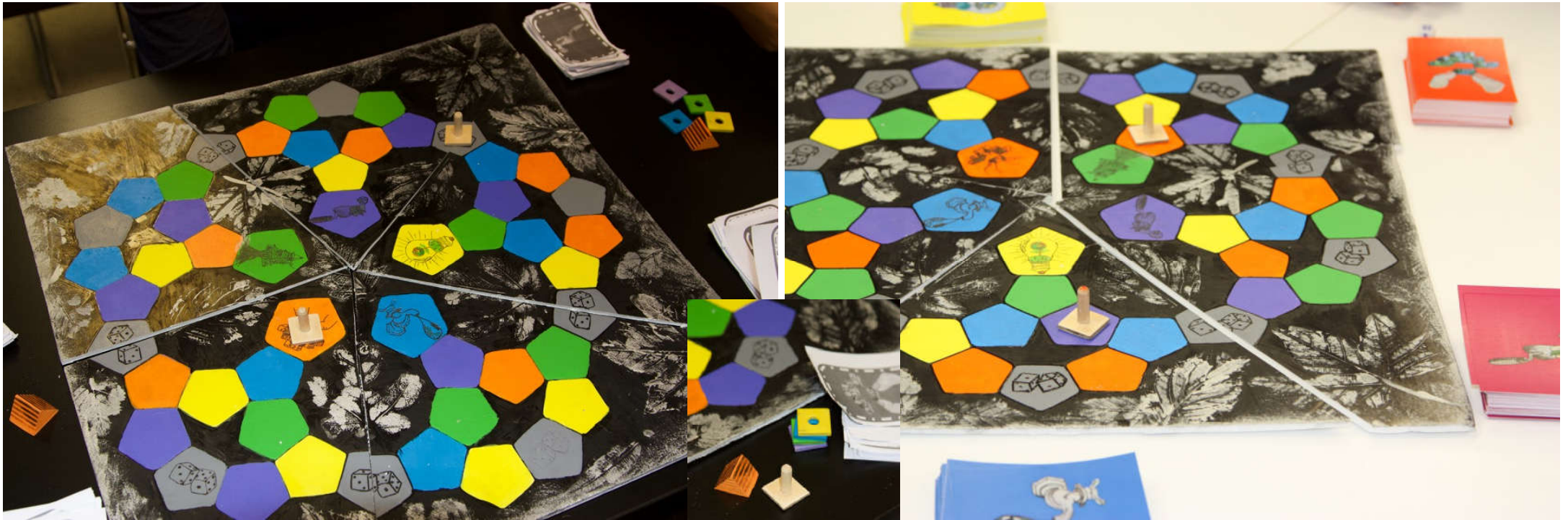
Testing the game – university



Game design



Game design



Testing the game – university



Testing the game – university





TESTING IN SCHOOL ENVIRONMENT

Testing the game – difficulties

- Try to contact a local public school:
 - Teachers very receptive
 - The board considered it an excellent idea
 - Never got an answer from school board...
- Then we made the option for a private school



Testing the game – implementation

- 1 class / 28 students
- 14~15 years (9th grade)
- 3 teams
- At the end, a small questionnaire to students
 - Game mechanics/rules
 - Learning
 - Overall assessment



Game testing at school



Testing the game - school



Testing the game - school



Game testing at school





FEEDBACK AND DISCUSSION

Feedback and discussion: high school

Give us your opinion about the game:

☐ Ecoblok

☐ SustHouse

P1. How do you rate the game?

Very poor ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Excellent

P2. Were you able to gain new knowledge about sustainable construction?

Very little ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 A lot

P3. Do you like the game and its relation to the topic?

No ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Yes

P4. Do you think the questions were well chosen?

No ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Yes

P5. Were the questions

Difficult ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Easy

P6. Did the rule book clearly explain to you how you would have to play?

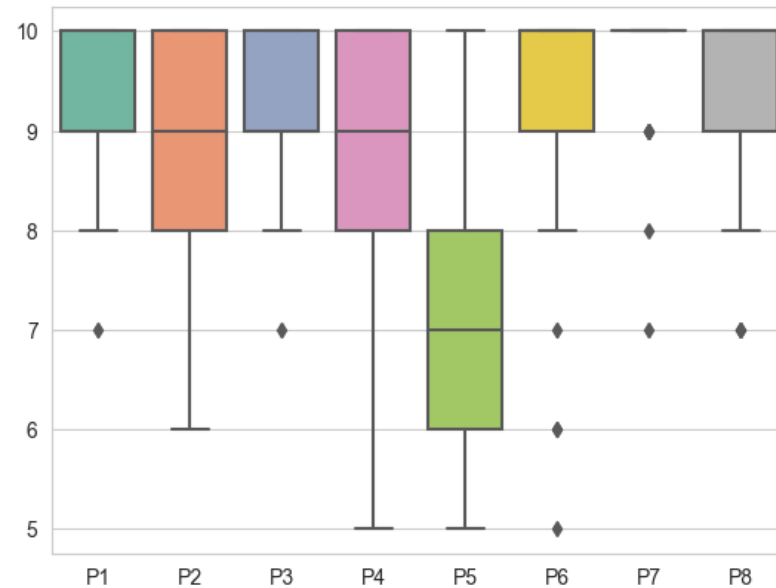
No ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Yes

P7. Do you think sustainable construction is an important issue?

No ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Yes

P8. Would you play the game again?

No ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 Yes



Feedback and discussion: high school

- The games implemented for high school students were well received and appreciated by the participants.
- The game design effectively engaged the students' interest and participation.
- They were pretty excited by having university students with them.
- They enjoyed playing the games and they say that they've learned about sustainability construction.
- They were very critic with the game rules are present some ideas for improvement.



Feedback and discussion: university

- Students say they enjoyed the experience.
- They say that some additional theoretical classes were needed.
- Assessment rules were considered as not the most advisable:
 - Individual report
 - Written test
- Students enjoyed going to high school.





FINAL THOUGHTS

Final thoughts

- Regardless of the results achieved, there will always be room for improvement, new challenges to embrace, and new paths to explore.
- Learning and teaching are living processes — they evolve with every new generation of students, every new idea, every change in our world.
- Yet, one thing remains unchanged: the continuing passion of teachers to inspire, and the endless curiosity of students to discover.



Acknowledgment

This research was funded in whole or in part by the Fundação para a Ciência e a Tecnologia, I.P. (FCT, <https://ror.org/00snfq58>) under Grant UID/6438/2025 of the research unit CERIS.



Thank you for your attention
I'm looking forward to see you in Aveiro



