

# Designing a MOOC for a Capstone Project in Civil Engineering

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# Outline

- **Introduction**
- **Challenges**
- **Course design**
- **Conclusion**

# Introduction (1/2)

- **Capstone project in engineering**
  - 1) Capstone project is important for engineering students
  - 2) Project-based learning is adopted in a capstone project

# Introduction (2/2)

- **MOOCs (Massive Open Online Courses)**

**Pros:**

- 1) Provide online courses for learners without the limitations of time and space
- 2) MOOCs require learners to be more proactive in their education
- 3) MOOCs usually provide an online discussion board for learners

**Cons:**

- 1) Teachers can barely interact with all of learners

# Challenges (I)

- **Few interactions among teachers and learners on MOOCs platform**
  - 1) Learners lack the interaction scenario to feel like in a real project

# Course design (I)

- Course videos are designed with role playing in scenarios to make learners feel more like in a real project



Teacher



Project manager

# Challenges (II)

- **Assessment on assignments**

- 1) Learners may be subjective and have different standards on peer reviews



# Course design (II) (1/2)

- Simple questions to check learners' submission of the assignments

The sheet list of doors

Assignment pictures

True-or-false questions

Type

Quantity

<門明細表>	
A	B
族群與類型	數量
單開-矩形-(1):	3
單開-矩形-(1):	1
單開-矩形-(1):	5
單開-矩形-(1):	11
單開-矩形-(1):	2
鐵捲門(甲種):	1
鐵捲門(甲種):	2
鐵捲門(甲種):	3
雙開-矩形-(1):	1
雙開-矩形-(1):	1
總計: 30	30

- Does the learner export the Sheet list of doors ?
- As the list shows, is the total number of doors 30?

Screenshots of peer review questions



# Course design (II) (1/2)

- An imaged-based format is taken as the hand-in format for assignments



Screenshots of decorations in the peer review assignment

# Challenges (III)

- **Picking out top learners**

- 1) Using only the scores of assignments to find the top learners is not enough
- 2) Need a final project report in the format of portfolio



# Course design (III) (1/4)

- A portfolio is needed for picking out top learners

The portfolio	
Description	Learners have to organize the weekly works they have done and the extended work suggested by the course team to make the portfolio.
Format	Learners can choose the formats they want.
Assessment	(1) Completeness (2) Practicality (3) Advanced technology (4) Format consistency (5) Innovation

# Course design (III) (2/4)

Index	Criteria
Completeness	Check whether the portfolio contains the extending part of each assignment or not.
Practicality	Check whether the extended project outcomes can be used in a real case for <ul style="list-style-type: none"><li>•owners</li><li>•designers</li><li>•constructors</li><li>•operators</li></ul>
Advanced technology	Check whether they used advanced technology such as <ul style="list-style-type: none"><li>•modeling software</li><li>•analysis software</li><li>•management software</li><li>•application developing</li></ul>
Format consistency	<ul style="list-style-type: none"><li>•Check the consistency of portfolio format, such as the word size and fonts.</li><li>•Check the consistency of colors.</li></ul>
Innovation	Check whether the portfolio addresses new issues not be mentioned during class and by hints.

# Course design (III) (3/4)

- **Examples**



# Course design (III) (4/4)

- **Assessment process for selecting the top learners**



Peer review



By course assistant



By professional engineer

# Conclusion

- **Addressing challenges through design**
  - 1) Design scenarios to make learners feel more like in a real project
  - 2) Design questions and the hand-in format for learners to peer review assignments in a more objective and consistent way
  - 3) Design a format of portfolio for final project report
- **Share the experiences for educators who want to design the same type of courses on MOOCs platform**

**Thanks for your attention !**