Teaching Sustainability: Running a MOOC on "Sustainability in everyday life"

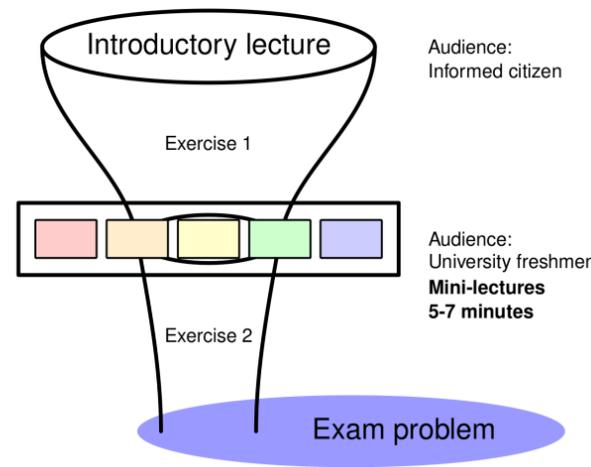Matty Janssen, Anna Nyström Claesson, Christian Stöhr, Tom Adawi

CHALMERS

1. What is a MOOC?

M – Massive, O – Open, O – Online, C – Course

- E-learning on a global scale
- Participants of all ages and occupations
- Education free of charge
- Developed at universities and can be either based on on-campus courses or courses developed from scratch
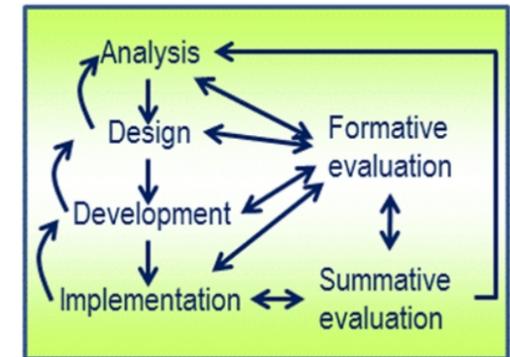
2. "Sustainability in everyday life"

- One of the first two MOOCs developed at Chalmers
- First run during Summer 2015, second run during Fall 2016
- First run had more than 9000 enrollments, the second run almost 4000
- Themes addressed: chemicals, climate, energy, food, globalization

Introductory lecture — Audience: Informed citizen

Exercise 1

Audience: University freshmen
Mini-lectures 5-7 minutes

Exercise 2

Exam problem

3. What is the ADDIE model?[1]

- Model for an iterative instructional design process, where the results of the formative evaluation of each phase may lead the instructional designer back to any previous stage.
- Used as a tool to reflect on the various aspects of the MOOC

4. Our experiences[2]

- Ownership of idea
- Different roles – owner, teacher, learner, negotiator, designer etc.
- Important to communicate pedagogical idea
- Intensive production, open and agile working atmosphere
- Planning sometimes did not work

	Analysis	Design	Development	Implementation	Evaluation
MOOC on sustainability	Educating the world → Targeting the informed citizen	Knowledge developed during the course → Along the "funnel"	What knowledge? Systems thinking Evaluating news	Format of lectures → Introductory lectures and mini-lectures	While far from the biggest, the MOOC attracted a significant amount of participants
What content?	Profile of the informed citizen → Passed compulsory school	Contents of the MOOC → Top sustainability themes in the news	Sub-division of the themes → One theme per "funnel"	Lectures' connection to exercises → Exercises linked to intro and mini lectures	Themes were based on a survey of the news. We were not criticized for the chosen content.
What happened during the 1st run?	Managing of time constraints → Agility	Sequential launch of themes? Use of a β-tester	Feedback in discussion forum → Revise exercises during the course	One theme per week. Mostly civil discussions in forum, but harsh criticism at times	Videos were generally well received. Some exercises were heavily criticized. The exam was quite well received.
What happened during the 2nd run?	Revisions to improve quality → Quizzes and exercises	MOOC for research purposes → New exercise on climate change	Topics that were lacking → New mini-lectures (e.g. on plastics)	All themes available from start. Constructive and civil discussions in forum	The discussions on the forum were well-informed. The 2nd run went much more smoothly than the first one.

5. Pedagogical design

- Instant feedback from discussion forum
- Possibility to redesign while running the MOOC
- Add missing content and keep it up to date
- Use of learning analytics as feedback

6. Run 1 versus Run 2

- The experience of the 1st run and familiarity with the medium aided the 2nd run
- We recorded new videos for the 2nd run
- The assignments were scrutinised before the start of the 2nd run of the MOOC
- Less funding for the 2nd run
- Civilised and constructive discussion forum during the 2nd run

8. Conclusions

- The ADDIE model is a useful tool for reflecting on and improving the MOOC for the 2nd and coming 3rd run
- The MOOC is a dynamic learning facilitator
- Flexible learning tool: it is possible to make changes while running a MOOC

7. Future improvements

- Add videos on indicators and UN 17 sustainability goals
- New assignment on climate change
- Move content to a local platform to facilitate access for Chalmers students
- New uses – pre-knowledge test for those who are not familiar with sustainable development and a complementary education to fulfil Chalmers' demand of 7.5 credits of Sustainable development courses

References

[1] R.A. Croxton & A.S. Chow. *Q Rev Distance Education*, 16.4 (2015), pp.83-96.
[2] M. Janssen, A. Nyström Claesson, M. Lindqvist, In: *New Developments in Engineering Education for Sustainable Development*, Springer, 11 (2016), pp.113-123