







Use of MOOC/SPOC and Flipped classroom

Guido Wyseure

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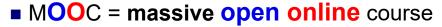


Use of IrriX MOOC/SPOC



- Introduction: MOOC, SPOC and flipped classroom
- Active learning and flipped classroom
- Beta test of MOOC/Flipped classroom
- Short comments on production of online MOOC material
- Concluding comments

What is it?



- □ Massive is order of magnitude of 1000's but low 5% completion
- **XMOOC** (extended; video-lecture), **CMOOC** (**c**onnectivity; networking oriented)
- SPOC = small private online course (can be Looc; L= local)
 - ☐ Small is class/lecture room size (e.g. 20 to 200)
- Flipped classroom = student-centered teaching by well prepared & active students; (< > teacher centered lectures with passive students)
 - □ teacher becomes rather an observer/facilitator
 - ☐ Preparation often by **Online** material (... but *not* necessary)

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Online is an important keyword



- □ Online both learning + students distributed in time and space
- Sharing Online material between universities/institutes on an international scale
- Can be linked to online communication/information
- But <u>not</u> a <u>quick</u> or/ <u>neither</u> a <u>cheap</u> fix !! Rather high investment and requires <u>educational</u> and ICTS <u>support</u>

Ambitions/objectives with IrriX



- Have a **successful MOOC**
 - □ Contributing to **better irrigation** (70% of world wide water use; 40% of food production; less Water for more Food)
- **Publicity** for Water Resources Engineering (IUPWARE)
 - ☐ Attracting good students (VLIR ICP MSc course)
 - ☐ Setting up research & education cooperation projects with partners
- Use in <u>teaching</u> (as SPOC) by preclass prep & flipped class
 - ☐ "Irrigation and drainage" for Bio-irs LB/ACE (agronomy ?=> 40% of food)
 - □ "Irrigation agronomy" for IUPWARE
 - ☐ Our students can get a certificate for free (complying with the MOOC)

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Vision rector Wageningen Univ. (WUR)

Short 1 minute video:
https://youtu.be/kChuwH1gC1l

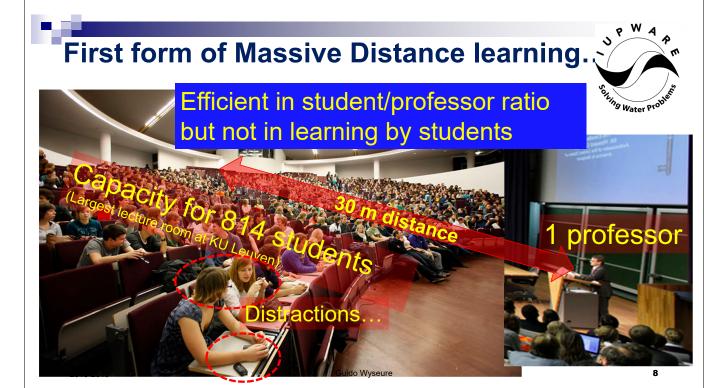
 Oriented to food production/provision in a sustainable way







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Independent preclass learning => prepare the flipped classroom by a MOOC



- How to access the material?
 - □ normally **online** (but not necessarily; "old fashioned" paper book)
- Where is the material?
 - □ MOOC/SPOC (but traditional handbooks/workbooks are in principle also possible)
- What activities in the (pre-)learning?
 - □ Video, exercises, questions to answer, text, presentations
- How to ensure the pre-learning and coming well-prepared to the learner-centered activities
 - □ Test? Bringing some results/output to step 2?





- Short videos of 5 to 7 minutes, adjusted to attention span of Smartphone generation
- Exercises; quiz with fast automatic response + suggestions
- Video illustrations as contextualisation: example of <u>Don René interview</u> in Potosí (<> powerpoint with static photos)
 - ☐ Giving better virtual extra reality experiences (but not a substitute to field/laboratory work; rather complementary)

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Engaged learning in class (after self-study)



- Collaborative learning in small groups
 - □ Each student makes a <u>short summary/ synthesis</u>; <u>formulates a question</u> and submits to the lecturer before the contact moment; lecturer selects questions for group discussions
 - □ Each group discusses questions to understand the material/concepts (avoiding misconceptions)
- Applying the key concepts to cases; examples; problems in groups



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MOOC (ready for launch in end October 2019) IrriX





=>Central focus is irrigation efficiency (IrriX)

- Module 1: What is irrigation efficiency (future to be integrated)
- Module 2: Irrigation requirements (covered by classical teaching; future to be integrated))
- Module 3: Field application efficiency
- Module 4: Water conveyance and distribution efficiency
- Module 5: Integrated view and case studies (can be integrated in integrated water management course)

Planning



- Registration into MOOC via URL
 - □ Invitation e-mail via Toledo: common module
- Module 3 opens 15 March 9 AM
 - □ Pre-class to finish 26 March
 - ☐ Flipped classroom 28 March
- Module 4 opens after module 3 (28 Mar 12 UTC)
 - □ Pre-class to finish 24 April
 - ☐ Flipped classroom 25 April
- Pre-class preparation compulsory before class.

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Flipped classroom

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- Only after compulsory pre-class preparation 🍇 water Pro
 - □ edX system registers the use of the MOOC, solving exercises
 - Sorry, big brother watching...
 - □ Every student sends (deadline 24 hours before meeting)
 - General question on the material
 - What was the most difficult concept to understand/master?
 - What would be interesting to expand (beyond the module)
- Flipped classroom in randomly selected groups of 5 (mixed bio-ir / IUPWARE students)

Explanation and discussion in random peer groups of ~ 5 students:



Activities in flipped classroom

- Every **randomly** selected group (of 4 to 5 students) explains/discusses questions (from preclass) (40 minutes) se
 - □ Chairperson (**randomly selected**) in every group explains to the group
 - □ Not an examination! But a way to avoid misconceptions + enforcing good understanding
- Plenary summary + feedback of the important points from the discussion in groups (10 minutes)
- Exercises by the same groups (randomized data)

Impact on the evaluation



- Counts as <u>one exercise</u> if well executed
 - □ No need to submit at the end an exercise on this part
- Theoretical question on exam as before (list of questions will be provided)
- Not complying with the pre-class conditions means
 - □ No access to the flipped classroom
 - Minus 10/20 per module on the exercise (so 0/20 if no attendance)

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Beta-test of the IrriX MOOC + SPOC



- Supported by Brian.Carthy@kuleuven.be
 - □ MSc graduate of Water Resources Engineering
 - ☐ Responsible prof Guido.Wyseure@kuleuven.be
- To discover all difficulties; need for improvements
- Evaluation afterwards of study load, teaching effect,... + leading to improvements
- MOOC in



at KULeuvenX

Framework of IUPWARE









The use IrriX MOOC



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Large investment in IrriX



- +/- 90 000 € (grant 60 000€ by Global Minds)
 - □ One person year for a research associate (RA)
 - Script production, video recording in studio or field, producing + editing videos by Premiere Pro + subtitle corrections in Youtube
 - 8000 € for a 2 minute trailer (professional Limel team: director, camera + sound man + video editor)
 - Jobstudent for producing illustrations + animations
 - 3000 € 4K Video camera, special micro's, tripod, larger screen, creative adobe suite software, PC's (one for rendering is advised)
 - Travel cost to Latin America for RA for video taping
 - □ Not my time (+/- 40% of past year) + not travel costs in VLIR-projects



Few numbers on IrriX



- The 4K recorded video requires 0.5Gb per minute (=> several 100's Gb storage on Dropbox not Box...+ on external Terra SSD-HD)
- 45 video's on IrriX with total duration of 3h37 min
 - ☐ Youtube-Video's in HD resolution is about 8 Gb
 - □ Average 4min 50 per video
 - □ 29 video's in studio, 11 in the field (mainly Bolivia, Ecuador & Peru/ Spain (Soilcare EU project) and Belgium), 5 interviews

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Probably release IrriX MOOC



- Run: end of October 2019
- "instructor paced" during 6 weeks; English version
- Spanish version in preparation in cooperation with UMSS,
 Cochabamba and others



Added value for cooperation



- "Young" developing institutes have MOOC/SPOC material available
- Young lecturers with PhD can make use of this material
- Modern teaching methods are possible (active and not passive learning)
- Being part of a larger international community for teaching university courses
- But it should become a two-way interaction/cooperation:
 - □ Case studies and problem cases can be delivered by cooperating institutes
 - □ Ownership by creating videos/ modules as contribution to improving the "MOOC/SPOC"
 - □ C of "MOOC/SPOC" could also stand for collaboration not only for Course

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General conclusions



- Large investment in time and expertise => collaboration & cooperation + MOOC-development support needed
- Can be <u>shared within several courses</u> => share experiences/ development effort
- Supports educational model of <u>deep active learning</u> => flipped classroom
- Local open or Small Private use versus Massive open but same material (only names...)

IrriX is supported by:









Thanks to many contributors