



# Using MOOCs in a S. T. E. M. classroom



Science



Technology



Engineering



Math



# Differences between classical MOOC and $\mu$ MOOC

- Very wide audience
- Very different participants
- 
- More specific audience
- Participants with more similar background and knowledge
- 

If we are developing an e-course to use with our students, then it is a  $\mu$ MOOC?

What would You add here?



# ADDIE MODEL

## Implementing E-Learning

### PREPARATION

- Strategy & leadership
- Scope of project
- Business case & resourcing
- IT & people support



First step - planning!



# Structure

- set of videos (5-10 minutes each)
- multiple-choice questions
- assignments, tasks. Student have to upload assignment solutions into the MOOC platform. Assignments can be evaluated and graded:
  - automatically when possible
  - peer-to-peer: students evaluate and grade themselves
- forum, where students post questions that other students can answer
- reading materials - provided within the MOOC content or linked to open access texts



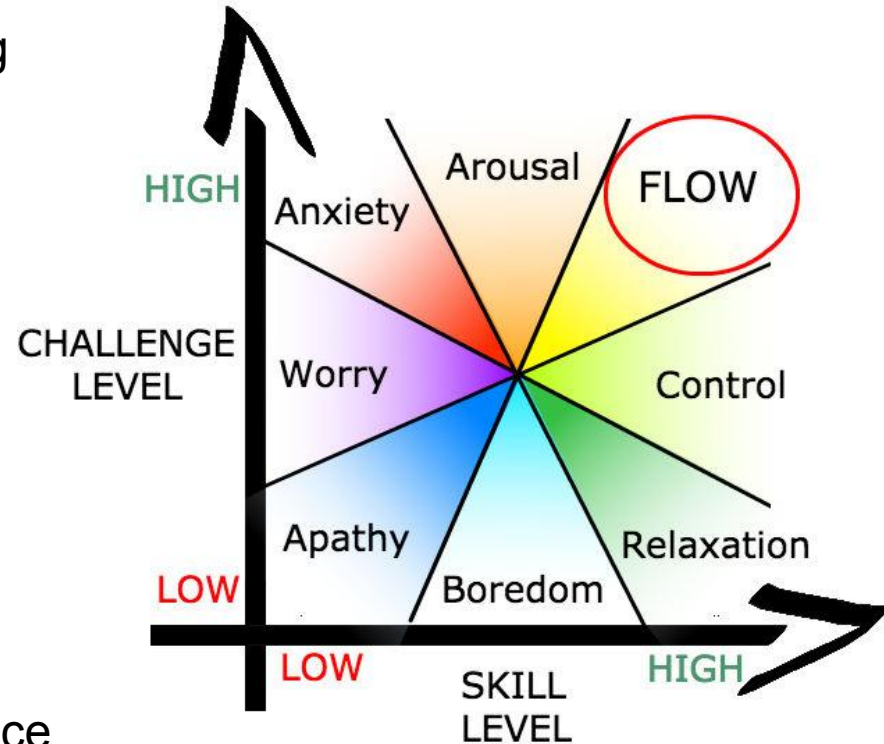
# Possible mistakes and drawbacks (and how to avoid them)

- Impersonal nature, studying in isolation
- Lack of feedback
- Many will try but few will pass - especially when there are huge number of participants
- The self-motivated, work-as-you-please atmosphere doesn't work for everyone
  - ★ the students who succeed in the MOOC environment are often self-motivated, self-directed, and independent individuals who would push to succeed anywhere



# What to keep in mind?

- Students are different and their learning styles are different
- Students want to know the connection with real life
- Fun and learn in the same time
- Not too easy and not too difficult
- Flow
- Meaningful feedback
- Test it before starting with wider audience





# Different pedagogical approaches

- Problem-based learning (PBL) is a student-centered pedagogy in which students learn about a subject through the experience of solving an open-ended problem found in trigger material.
- Collaborative learning is a situation in which two or more people learn or attempt to learn something together. Unlike individual learning, people engaged in collaborative learning capitalize on one another's resources and skills (asking one another for information, evaluating one another's ideas, monitoring one another's work, etc.).
- Community-based learning (CBL) is a teaching strategy that bridges academic theory and real-world practice. CBL promotes students' academic learning and civic development while simultaneously addressing real world problems, community needs and interests.

# Learning Styles

## VERBAL

Words are your strongpoint!  
You prefer to use words both  
in speech and in writing!

## VISUAL

You prefer to use pictures,  
diagrams, images and spatial  
understanding to help you  
learn

## MUSICAL / AUDITORY

You prefer using sounds or  
music or even rhythms to  
help you learn.

## PHYSICAL / KINAESTHETIC

You use your hands, body  
and sense of touch to help  
you learn. You might 'act  
things out'.

## WHAT'S YOUR LEARNING STYLE?

## LOGICAL / MATHEMATICAL

Learning is easier for you if  
you use logic, reasoning,  
systems and sequences.

## SOCIAL

You like to learn new things  
as a part of a group.  
Explaining your  
understanding to a group  
helps you to learn.

## SOLITARY

You like to work alone. You  
use self-study and prefer your  
own company when  
learning.

## COMBINATION

Your learning style is a  
combination of two or more  
of these styles.





# Assessing

- Self-assessment - questions that are integrated into learning materials and guide learner to review, repeat and summarize what was learned.
- Computer assessment - usually test and questions with multiple choice answers or setting the words into right order.
- Tutor assessment - written assignments (essays, reports, projects, etc).
- Peer assessment - non-formal comments while doing the group work and formal feedback to individual assignments.

What do You use most, why?



# The 4D model



- goals
- audience
- tasks
- timeline

- stories
- research
- adjustments

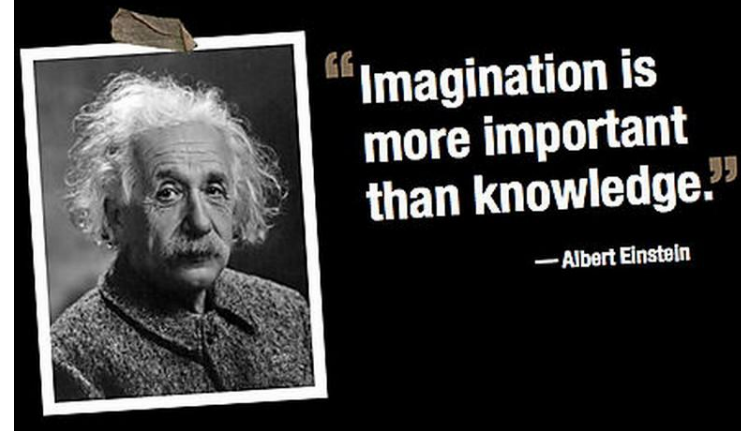
- implementation

- progress



# Groupwork time

- 4 groups
- Each group have to sketch a very simple STEM-classroom MOOC
- Think about structure components - use at least 5 different components (etc video, reading text, presentation, assignment, discussion forum, ...) please specify and open up the topic you choose
  - for example, if you pick “video”, you have to write which kind of video or what this video teaches to students
- Groups have to present their result to others and please explain why your group selected this topic





# References

- <http://desarrolloweb.dlsi.ua.es/moocs/structure-of-a-mooc>
- <https://www.thoughtco.com/problems-with-online-classes-1098085>
- <http://www.newyorker.com/science/maria-konnikova/moocs-failure-solutions>
- <https://www.innovatsioonikeskus.ee/sites/default/files/konverents16/t%C3%B5nisson.pdf>
- [https://en.wikipedia.org/wiki/Problem-based\\_learning](https://en.wikipedia.org/wiki/Problem-based_learning)
- [https://en.wikipedia.org/wiki/Collaborative\\_learning](https://en.wikipedia.org/wiki/Collaborative_learning)
- <https://gustavus.edu/communityservice/faculty.php>
- <https://www.slideshare.net/raventools/project-management-secret-you-are-all-project-managers>