

Application of remote experiments in a secondary school using MOOC approach

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10 contemporary pedagogy:

1. learning in informal settings
2. learning through argumentation
3. incidental learning (smartphones, games, fictions movie)
4. context-based learning from their experience
5. computational thinking /problem solving
6. learning by doing science with remote labs
7. embodied learning involves the interaction of the body with a real or simulated world
8. adaptive teaching by an adapted content for each student
9. analytics of emotions
10. assessment measure and support the 21st-century competencies (automatic data collection with reach digital environments, e.g., online game-playing)



ODL project

Main task:

- to introduce the use of MOOCs in school curricula
- in conjunction with the STEM laboratories (online and hands-on).



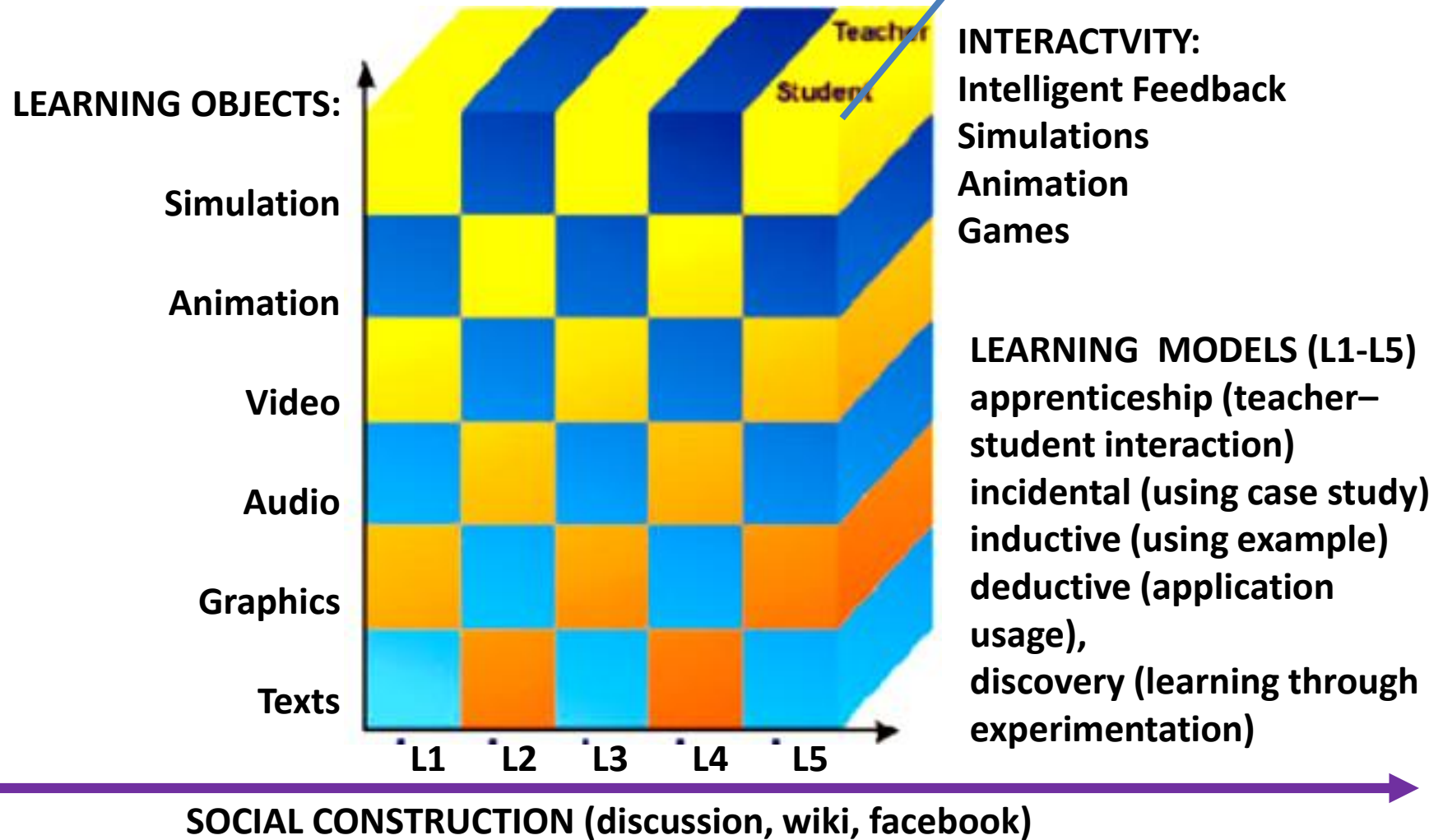
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MOOC 4D model *Nish Sonwalkar (2013)*



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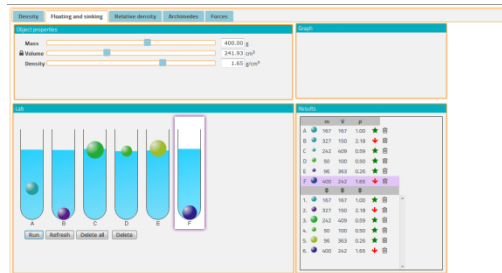
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ODL: micro-MOOC

Content-load, time consuming and classroom activity



microMOOC
+



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micro-MOOC: structure

- Intro (text or short video) – info about the topic of the study, or discussion topic, what will be assignment
- Lectures (usually, set of videos)
- Readings (suggested literature, wikipedia, pages from study book, provided copies from other books)
- Assignment (could be video/audio instruction): work on the forum



micro-MOOC: structure

- Evaluation:
 - Self-evaluation
 - Peer-evaluation
 - Teacher evaluation
 - Learning Analytics
- Usually self- and peer- evaluation uses



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edX as a platform for micro-MOOC

- Open edX Studio (Authoring tool)
- The Open edX LMS (Learning Management System)
- Several Blocks – implements assessment problem type in a platform
- Discussion forum



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ODL MOOC Platform - LMS: Student's dashboard

Dashboard | ODL Moocs | Welcome | edX Studio | Primer usuario

moospace.odl.deusto.es/dashboard

Apps Dictionary Library EU-ICT eMails GameBL Accessibility Home Importado desde Fire GoLab erasmus_plus Labs Erasmus-Plus CONFERENCE Other bookmarks

MY COURSES

Electricidad y electromagnetismo
UD - Tecnologia_1314
Started - Jan 18, 2017
View Course

Ανιχνεύοντας Βαρυτικά Κύματα
Ellinogermaniki_Agogi - EA102
Starts - Mar 01, 2017
View Course

"Stop Noise Pollution"
Noise pollution
ODL_FD - Physics_12-15
View Course



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Inquiry method

- ENGAGE
- EXPLORE
- EXPLAIN
- EXTEND
- EVALUATE



Rodger W. Bybee



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Time schedule

Phase	Description	Time	Total time (min-max)
1	Topic Introduction	1-3 min	1-3
2	Student Engagement and Motivation	4-6 min	5-9
3	Initial Exploration of the virtual/remote Lab	3-6 min	8-15
4	Questioning - Stimulating curiosity	2-4 min	10-19
5	Performing virtual experiments I	2-5 min	12-24
6	Questioning - Stimulating reasoning	2-4 min	14-28
7	Performing virtual experiments II	2-5 min	16-33
8	Questioning – Providing reasonable explanations	2-4 min	18-37
9	Performing virtual experiments III	2-5 min	20-42
10	Questioning – Providing concluding remarks	2-5 min	22-47



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Resistors in series connections

moospace.odl.deusto.es/courses/ODL_UD/Physics_13-15/2017-S2/courseware/cecf0f4e2848417fa44d4117a362444d/

Apps Dictionary Library eMails EU-ICT GameBL Accessibility Home Importado desde Fire GoLab erasmus_plus Labs Erasmus-Plus CONFERENCE Other bookmarks

ENGAGE

EXPLORE

EXPLAIN

EXTEND

EVALUATE

Visir instruction

VIEW UNIT IN STUDIO

Bookmark

Hols in columns are connected. We will use

visir
(Visir experiment)

07.12

DC Power Supply

Function Generator

Ch1 Oscilloscope

Ch2 Oscilloscope

DMM Voltmeter

mA

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University of Deusto

CREATED USING BwToon



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micro-MOOC: basic requirements

- affective engagement of the students;
- harmonize learning process for students with different knowledge and interest;
- generating curiosity and leading to questions;
- a cognitive conflict;
- scientific investigation and explanation within the competence of the students involved;
- creating scientific knowledge;
- requiring the students to use inquiry skills to explain the involved phenomena;
- limiting time of use (1–2 lessons for the presentation and applying of remote/virtual labs



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Future action

Creating the library of the microMOOCs and implementation in a class in the EU countries



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THANK YOU!



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