Designing for Flipped Teaching and Learning: leveraging the potential of learning analytics and gamification

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Focus

- How do we design a Flipped MOOC? What are the challenges?
- How about gamifying the content-driven direct instruction for engagement, motivation and creation of sense of community?
- How do we leverage the potential of Learning Analytics to inform the learner and the teacher

MOOCs and their Design

Massive Online Open Courses – we all know what they are ☺

- xMOOCs - most typical type of MOOCs - mainly university content transferred online
- cMOOCs - Connectivist MOOCs
- etc

Context: Flipped Classroom

- Blended learning, most widely used to deploy MOOCs in the university context
- One of the effective approaches can be Flipped Classroom:
  - Direct instruction at home and online – video driven classes, prior to classroom
  - Active Learning / interactions - in the class

Research says about flipped classroom

- Highly engaging classroom-wise
- Students prefer to have interactions online, but do not prefer video lessons to real lectures
- findings suggest that a MOOC-based flipped class is a good solution to promote student's motivation and learning, but the implementation of this teaching strategy is delicate and must be very well planned. [Rodriguez et al,2017]

Online phase

- Now: Direct instruction
- Flipped Classroom situates the online phase on individual learning, self-regulation and content orientedness
    - Videos, quizzes…

Desired state:

- Student - Motivation, engagement, reflection, interactivity, sense of community, collaboration
- Teacher – feedback, planning the design and evaluating the design, connecting the classroom and online phases

Offline phase

- Now: Active learning
  - Interactivity
  - Problem based learning
  - Project-based learning
  - Collaboration
  - Sense of community
  - sometimes clickers, mobiles/tablets, other digital artefacts and tools
- Desired state:
  - feedback loop
  - planned activities according to the online phase and progress

Challenges

- Any gaps learning design-wise?
- Added value of technology?

Learning design

- Teaching is designing experiences
- *the creation of appropriate learning environments to foster learning, the need to build on prior learning and the importance of reflection (Bransford et al. 2000)*

Learning Design

- Flipped MOOCs can be effective in terms of learning results BUT requires explicit design
- Making the implicit explicit through Learning Design
- Instructionism vs constructivism - instructional design vs learning design
- *Learning design as an area of research and development includes both gathering empirical evidence to understand the design process and the development of a range of learning design resources, tools and activities. (Conole, 2013, Designing for Learning)*

Design and orchestration

- It is suggested that the success of the Flipped MOOC depends very much on the design and orchestration of learning activities
- Orchestration: design, management, awareness, adaptation and role of actors [Prieto et al 2015]
- Focus on the Design, Management and Awareness phase but with other two components in mind

Flipped Mooc design

- For the flipped approach to work, we need to design it well:
  - We need to think about the cycle of design, implementation, evaluation and redesign.
  - We need to think about reflection and awareness for the teacher and for the student
  - We need to think about the added value of technology.

- All of these lead to:
  - gamification as a design strategy

GAMIFICATION

- is a technique that is been applied in education in both online and offline environment, as well as in other fields

- it consists in applying **elements of game** in a context that is not a game to produce an effect in users' behaviours

Game Elements' Examples

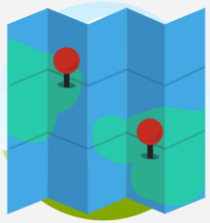
score

badges

Avatar

Clear Goals

Time Limits



Missions

Clues

Feedback

Which game elements are we going to use today? (1)

1. Empowerment

Enable user to perceive that he/she can impact on the situation, have a sense of control

2. Smooth Learning Curves

it keeps the user in continuous learning progress and in mastering his/hel skills

3. Communication Channels

it enables communication via chats, forum, etc

4. Levels

part of the game in which all players' actions take place until a certain goal has been reached or an end condition has been fulfilled

5. Clues

hints given to users to solve a problem and/or to achieve a goal and unblock the next level

Which game elements are we going to use today? (2)

6. Goal Indicators
Are indicators that explicit the goals
7. Skills tree
Enable custom configurations of a character's abilities, often organised in branches
8. Guild
associations of players who chose to come together to achieve a common goal
9. Storytelling
the act of telling stories within the game
10. Stimulated Planning
enable users to plan future action or goals therefore the strategy to follow to complete a level or the game itself

Learning analytics Definitions

- Learning analytics is the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs.
- LA as a technology-enhanced learning (TEL) research area that focuses on the development of methods for analyzing and detecting patterns within data collected from educational settings, and leverages those methods to support the learning experience. (Chatti et al 2015)

Learning Analytics

- For students - (awareness, feedback, social comparison, progress, goal achievement, gamified dashboards)
- For teachers - (inquiry, action, planning, data-driven decision making, design evaluation)

Data - where do they come from?

- Sources of data:
  - Main source - big data, platform-based - digital traces of interactions with content, peers, teachers
  - Outside of the LMS data - distributed systems
  - Assessment data - grades
  - Quizzes
  - Peer assessment
  - Student Information Systems
  - Library
  - Can be also multimodal - sensor, tracking devices

Data - what can they show and do?

- Student
  - Show progress (towards a goal)
  - Compare results and achievements (social comparison)
  - Social network analysis
  - ITS (intelligent tutoring system - adapt (content)
  - Support the learner (reflection and awareness)
  - Nudge the learner if off track
  - Recommend learning paths

Data - what can they show and do?

- Teacher
  - aggregated progress view
  - identify learner groups and learners at risk
  - Social network analysis
  - analyse and visualize engagement
  - cohorts
  - Real time and retrospective (for course evaluation and redesign cycle)

Conceptualization and Workshop Assignment

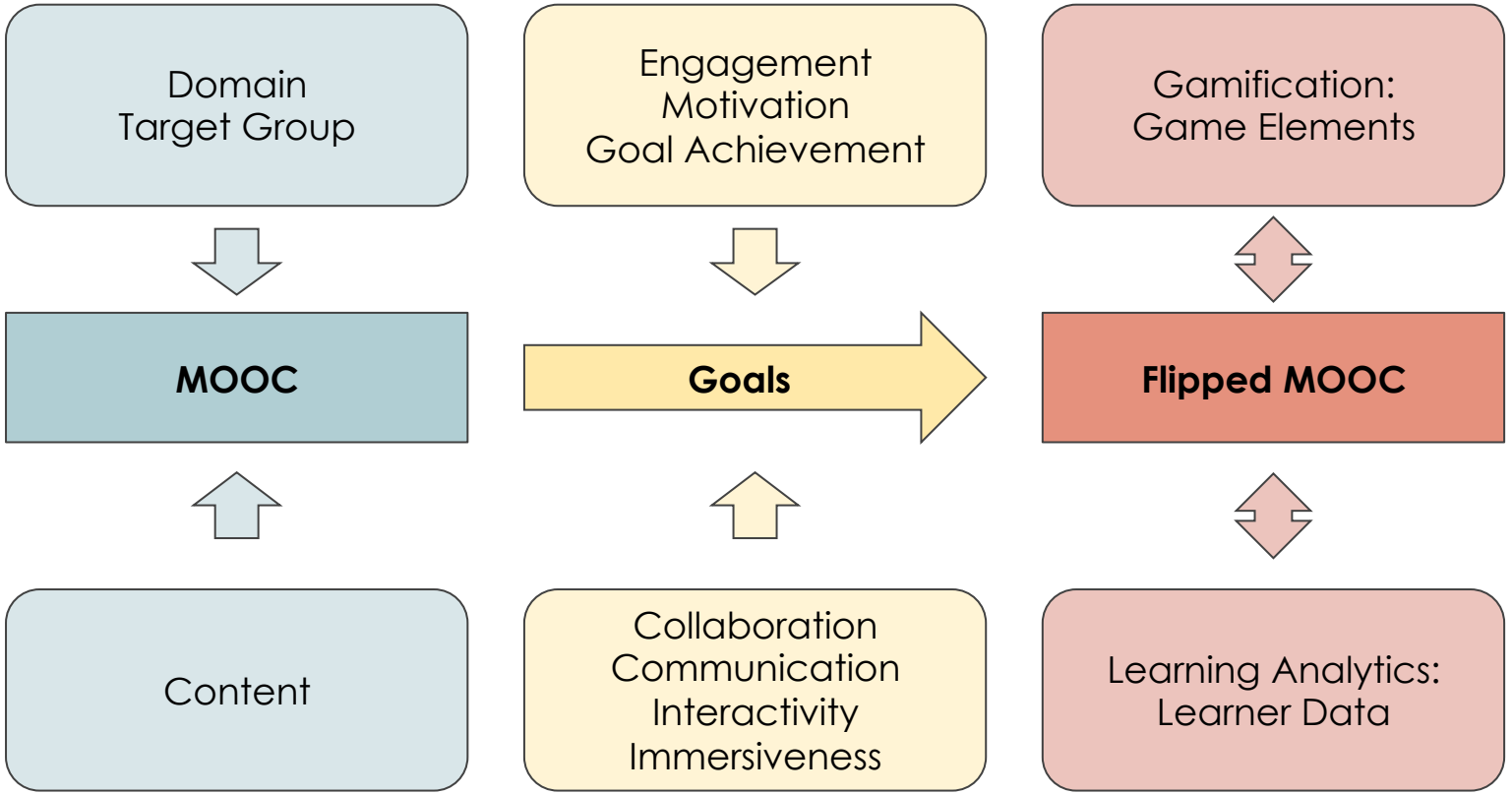
Where are we now?

- We introduced:
  - Massive Open Online Courses (MOOCs)
  - Online courses for mass audiences
- Flipped Classroom
  - Didactical concept in classroom education that flips classroom and home phases to offer more interactivity in the classroom
- Gamification
  - Application of game elements to non-gaming concepts to increase motivation and engagement
- Learning Analytics
  - Systematic use of learner data to improve learning processes

Flipped MOOC

- What is a flipped MOOC?
  - What do we actually flip?
- What is the role of Gamification?
  - Which game elements can we apply?
  - How do we do that?
- What do we need learning analytics for in that context?
  - Which data is available?
  - How can we make use of the data?

Towards a flipped MOOC



Workshop Assignment: Design a flipped MOOC

- Build groups of 3-4 participants
  - Give the group a name
- Select a domain, a topic, and a title for your MOOC
  - How could the MOOC be organised in sections?
  - How much content would you need?
- Review the list of game elements
  - Which would you choose for your MOOC (select 2-3 from the list)? Why?
  - How would you integrate them in your content?
  - Are you missing further important game elements?
- Apply learning analytics
  - Which learner data would each game element require to function?
  - How can we acquire that data?