Strategies for pan-european implementation of blended learning for innovation and entrepreneurship (i&e) education

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Introduction

• Part of the mission of EIT Digital (a Knowledge and Innovation Community from the EIT, European Institute of Innovation and Technology) is to train IT graduates at both Master’s and Doctorate levels, with strong innovation and entrepreneurial competences

• Each partner university implements an “Innovation & Entrepreneurship” (“I&E”) minor of 30 ECTS (European Credits Transfer System) that corresponds to 25% of the credits each student takes during the studies

• EIT Digital has been working now for over three years to implement blended learning strategy with different blended learning models with 18-20 top technical universities all across Europe
In 2014 we started producing online contents with aim to “blend” our I&E education. Based on the premise of “teachers-producers”, 7 University producers: Aalto, KTH, U Trento, TUB, TU/e, U Rennes 1 and UPMC (coordinator). At the moment we have more than 45h of high quality video contents on different I&E topics. The videos are packaged in thematic units composed of video contents coupled with a quizzes or an assignments. Each university in the network is visited, and blended courses are re-designed together with the involvement of the local teachers.
I&E (blended) education: contents production and dissemination

• In 2014 & 2015 production focus on generic I&E concepts

• In 2016 & 2017 production focus on EIT Digital flavoured contents

• In 2018 & 2019 production focus on digital transformation

*picture taken from a video lecture by Aalto
The models: explained

- **Flipped classroom**, where online contents are delivered to students before class and then discussed in class,

- **Blended online course**, pre-packaged online contents with assessments that in most of the cases are associated with supervised sessions in class,

- **Online starter kit**, set of online modules with assessments delivered prior to short-span events (such as summer schools for instance),

- **Independent levelling-up**, contents are delivered before class, accompanied with quizzes or assignments, not necessarily followed up in class,

- **Online repository**, online packages made available to cover students’ specific needs.
Courses Blending Models
Approach based on flipped classroom

Blended syllabus design

Requires less work to setup as approach, but requires syllabus changes and follow up of contents in class

the circle size indicates amount of workload

darker color = substantial
lighter color = can be skipped

pre-class

Blended syllabus design

in-class

post-class

Online materials

Clarifications and practice

Follow up?
Courses Blending Models
Flipped classroom blended class example

Pre Assignment
- Watch at two sets of videos about 2 different BM concepts
- Assess how students internalized the learning from videos
- Applying immediately the learning on their projects
- Refine their BM on their Business Idea

BM = Business Modeling
Courses Blending Models
Approach based on full online course

Session 1

- Online materials + assessment
- Clarifications and practice / analysis of cases

Blended syllabus design

Pre-class

Post-class

in-class

Follow up?

Requires less work to setup as approach, but requires syllabus changes and follow up of contents in class.

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Courses Blending Models
Example of full online course

**Rationale:**
BMC: business model canvas

- **T:** Theory
- **P:** Practice

### #1 INTRO
- Pre-class: T + assignment
- In-class: Clarifications (T)
- Post-class: T

### #5 BMC
- Pre-class: T + quiz
- In-class: Clarifications (T)
- Post-class: T (lecture)

### #6 FINANCE
- Pre-class: T + quiz
- In-class: P*
- Post-class: P

*3rd party materials

Clarifications (T)
(Examples + debate*, Presentations + discussions)

P

Group work

P
(examples + discussions)
Courses Blending Models
Approach based on online starter kit

Requires no work from teachers (the packages are centrally prepared) and does not require syllabus changes.

- Online contents 1 + assess.
- Online contents 2 + assess.
- Online contents 3 + assess.
- Course syllabus
- In class material
- Session 1

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Courses Blending Models
Summer school online starter kit

Students refresh their knowledge (or learn) independently I&E concepts with pre-packaged sessions on 5 modules (approx. 8h of student time). It is composed of the following themes:

- Introduction to assessing the impact of ICT technology (theory and models)
- Business Modelling / Business Model Canvas (process of Business Model Generation, building blocks of the BMC)
- Entrepreneurial Finance (Introduction, cash flow statement, balance sheet)
- Marketing in Technology Ventures (Introduction to customer-oriented marketing thinking & doing, creating, communicating & delivering customer value)
- Introduction to pitching (with examples)

After each module there is a quiz each composed of 10 questions. Students pass the quiz if they score 6 out of 10. They can take the quiz up to 5 times. The results are released only after the deadline.
Courses Blending Models
Approach based on independent learning

Prepackaged online materials + quiz(zes) -> in-class -> ‘To go further’ packages

Blended syllabus design

Session 1

Requires work to setup as approach (teachers helped in this), but does not require syllabus changes or to follow up of contents in class

the circle size indicates amount of workload

darker color = substantial
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Courses Blending Models
Example of independent learning class

BEGIN: Course Promotion

REGISTRATION

CONTENT

TEST

ONLINE MODULE

pass

fail

ONSITE MODULE

OnSite Lecture

OnSite Lecture

Completed

EXPERIMENTAL LEARNING IN GROUPS

Teachers are working as mentors & coaches

Industry experts’ first hand experiences.

END: FollowUp & recommendation
Courses Blending Models
Approach based on online repository

Requires work to setup as approach (teachers helped with this), but does not require syllabus changes or to follow up of contents in class.

Student specific clarifications

Repository

Course syllabus

Online material + assess.

In class material

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Example

Teachers invite the students to watch the materials of selected sessions, or they point to the students single sessions in the blueprints (a full online syllabus composed only of online contents) that can be relevant for the specific needs of the student in question.

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CROSS-UNIVERSITY COLLABORATIONS

Sorbonne – UPS collaboration on a course

Joint I&E Basics Online syllabus

1. Intro to DT
2. Business models
3. Opportunity recognition

Students at UPS

Students at Sorbonne

Student 1

Student 2

Student 3

Tu Twente, Tu Eindhoven and Tu Delft collaboration

Shared online assignment

Students at Twente

Students at Eindhoven

Students at Delft
CROSS-UNIVERSITY COLLABORATIONS

UNITN and UPM collaboration

- Students at Trento
- Students at UPM
- Shared Trento and UPM students teams
- Shared I&E course

UNITN and Aalto collaboration

- Teacher from Aalto gives lecture to Trento students
- Teacher from Trento gives lecture to Aalto students
- Students at Aalto
- Students at Trento
- Shared Trento and UPM students teams
- Shared I&E course
Discussion: cross-university collaborations, shared teams

- Problem of scheduling the times when to talk, i.e. to find time slots that work for students present at two different locations.
- Common problem reported were or from technological nature, problems with having adequate internet connection to do the calls.
- The students in general appreciate the collaboration between each other and say that it promoted better knowledge and practice exchange between the involved students.
- The collaboration provided benefit for the students on the development of their skill to work in distributed and physically colleagues.
- The collaborations were insightful for the effect of learning in distributed groups.
Conclusions and perspectives

• Here, I present modelling approach we took to blend our education: different models working better for different situations, starter kits working better for courses with project work, independent levelling-up and online repository being more relevant for universities with higher legacy in I&E education, and flipped classroom and full online course working better for universities recently hoping on the initiative.

• We have reported on the endeavor undertaken by the EIT Digital to set and implement blended learning within its I&E group, this case study contributes to the analysis of how blended learning can be diffused and adopted widely within networks of universities and suggested ways to integrate blended learning in higher education institutions, by creating the conditions for cross-university pedagogical collaboration with real impact on teaching.
Questions?

Thank you!