

Article

Strategies for Pan-European Implementation of Blended Learning for Innovation and Entrepreneurship (I&E) Education

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Abstract: New information and communication technologies (ICTs) provide educators and learners with novel approaches to enhance teaching and learning processes. Technology enabled learning plays a vital role in contemporary education and blended learning is widely adopted across higher education as a learning mode. In this paper we reflect on the strategies for introducing blended learning in a network of European universities and the first lessons learnt from the experience. A total of 18 universities took part with around 350 students registered in the 2018–2019 academic year. In this report we recount how the lecturers in our network introduced the blended learning in their classes, the different types of lessons resulting from this effort, as well as the teachers' and students' perceptions regarding the blended learning activities performed. Our reflection is focused on the use of blended learning and its positive effect on activating students and development of innovation and entrepreneurship soft skills. The perceptions on blended learning are interrelated, with the success of the blending models depending on the blended learning activities, and how well the respective online contents are embedded into the teaching and learning processes.

Keywords: blended learning; higher education; I&E education

1. Introduction

Limited resources, technological advancements, and shift towards new educational paradigms require faculties and other institutions of higher education to consider more attractive models of teaching and learning [1,2]. Universities move towards more engaging learning experiences with help of technologies. They change how they approach teaching and learning by redesigning the education process and the education environments [3]. The introduction of web-based technologies into learning and teaching processes have created unprecedented opportunities to deliver the subject matter in an innovative way and enable the students to work, collaborate and stay in touch with peers, faculty and contents, inside and outside of classroom [4].

Blended learning (referred also as hybrid learning) has been used to describe classes that combine online learning with face-to-face teaching and has been increasingly used in higher education over the last years [5,6]. Blended learning does not simply imply putting technology and education together and using technology as an add-on to teach a difficult concepts or provide additional supplementary material, blending learning requires fundamental redesign the way the courses are developed, scheduled, and delivered in higher education [1,7–9]. It is an activity of combining the traditional teaching activities (that is face-to-face teaching) and learning activities supported with technologies [10,11]. Blended learning is not a simple replacements of the classroom time and it includes leveraging on the the internet to deliver most optimal education. In the hybrid courses significant portion of the learning activities are conducted online and time traditionally spent in class

is reduced but not eliminated. The aim is to combine what is best from online education with in class education and to promote open, student directed learning with added flexibility for everyone. There is also to note that blended education is not distant education as courses are not offered entirely online or at distance.

Blended lessons allow students to meet first the subject matter before class, and like this, course organizers free up in class space for additional clarifications and encourage more in-depth processing of the course content when the class meets [12,13]. Different active learning strategies have been studied in the past and there is an empirical evidence that this way of teaching promotes students learning success and gain of knowledge and skills [14,15]. It stems from the theoretical framework of theory of activity which assumes that learning emerges from activity rather than passive passage of knowledge that happens in classical lecture courses [16,17]. Many studies agree that active learning promotes deep learning by stimulating inquiry, helps for better acquisition of skills, and suites different learning styles students' participants have [18,19]. Students who have been involved in the blended courses are in general very positive about their experience and the time flexibility.

In last years, large-scale initiatives on integration of blended learning in education curricula are being implemented all over the world. The case study on how blended learning has been adopted, supported and accelerated at the University of Western Australia has showed how institutional changes in strategies, structures and processes have been required to facilitate this move [20]. At the Education University of Hong Kong, a technology-driven professional development approach was set in place to encourage teaching staff to adopt blended learning in their courses with positive outcome [21,22]. ET4ET project prepares instructors to implement ICT supported student-centric teaching strategies in India: their results show that participants had high perceptions of learning, and more importantly, its intent to use blended learning in their own classes [23]. The Xanadu project at University of Turin uses a gradual approach to introducing university instructors to technology-enhanced learning: its effectiveness can be confirmed by the large number of faculty members continuing to use ICT to support their teaching despite having no technology enhanced learning (TEL) projects [24,25]. The National Effective Teaching Institute (NETI) is annually organizing a three-day teaching workshop in which lecturers are presented research based instructional strategies and evaluation to train their faculty members for blended learning adoption with a positive effect on teacher's practices [26,27].

This article presents the strategies we used for introducing blended learning in higher education institutions in a pan-European network of universities from the perspectives of lecturers and program coordinators and their experience with this form of course delivery. The network in question is EIT Digital and it is a consortium of 18 Technical universities training students with technical as well as entrepreneurial skills and competences. We present in details how lecturers converted their Innovation and Entrepreneurship (I&E) courses to blended I&E courses. Blended courses enhanced opportunities for student - teacher interaction, increased student engagement in learning and opportunities for continuous improvement. Students reported that the different blended models used in their education programs brought to greater flexibility in time when to study and improved learning. The challenges consisted of aligning blended learning with the goals of the institution, resistance to change, and lack of organization structure and experienced personnel for setting online education, which is also in line with other authors had concluded in the past [28].

To make it easier for the universities in our network to start from scratch using blended learning for their I&E courses we came up with support for the following scenarios of use of online contents: (1) flipped classroom, where online contents are delivered to students before class and then discussed in class, (2) full blended online course, where pre-packaged online sessions with assessments are opened to the students prior to the lessons and in most of the cases associated with supervised sessions in class (3) online starter kit, where set of online modules with assessments are delivered prior to courses or events (4) independent levelling-up, where contents are delivered before class, accompanied with quizzes or assignments, not necessarily followed up in class, (5) online repository, where online packages are made available to cover students' specific needs.

The paper is organized as follows: in Section 2 the educational context in which we introduced blended learning is presented as well as conditions that were met so that we could pilot blended learning, in Section 3 the blended strategies and their characteristics are presented, and in Section 4 the leanings from the deployment are elaborated, and in Section 5 reflection on the generalizability of the approach and the next steps are presented.

2. The Educational Context

EIT Digital is an independent European body leading European digital innovation. The EIT Digital Master School is a joint initiative by the leading technical universities and business schools in Europe with the aim to train IT graduates, with strong innovation and entrepreneurial competences. The partner network of universities provide cutting-edge ICT education in combination with innovation and entrepreneurship (I&E) education. To implement the I&E component, each partner university in the network implements an “Innovation & Entrepreneurship” (“I&E”) minor, for which the universities offer four I&E courses.

With the evidence that blended learning is an effective methodology, it was decided that a blended strategy should be set in place for the blended I&E education. There was the need first to set a production agenda of online contents: the choice was made that a few chosen teachers from the I&E minor in the different universities would also be producers of contents and deliver online contents to be used by all I&E teachers in the network. The teachers were chosen by an EIT Digital Online Production Coordinator and they were chosen based on the university capacity for production (the universities needed to have technical studios for doing this) and preparedness and knowledge of the local professors in the domain of the specific themes planned for production. The emphasis was put on the modularity of the online contents, that is to make them short and easy to reuse in different contexts. Therefore, the producers were asked to deliver the piece of contents as small blocks, that were on purpose made short and straight to the point, for smoother adoption. These videos are main blocks out of which teachers build a blended learning course. EIT Digital library includes now more than 600 videos covering from basic business model videos to the most complexed technology transfer strategies and lectures on entrepreneurial cases. The library amounts to more than 60 h' of videos along with dozens of written cases, quizzes and other form of online/offline assignments [29].

To get teachers on board, there was the need to guarantee that the tools and dedicated ICT infrastructure will be set in place, will be kept up to date and well-adapted, in order to effectively support the blended learning. EIT Digital provided a complete learning management system (LMS) and it meant a secured repository that provided basic features to share content with students. Moreover, contents produced were always packaged with additional documents to enhance the teacher's ability to deliver the course, such as written descriptions, suggested assignments and suggested additional pedagogical material. As part of an EIT Digital online contents dissemination efforts, each university in the network is visited, and blended courses are co-designed together with the involvement of the local teachers. The universities were visited by an EIT Digital Online I&E Dissemination Officer with the aim to (1) show the I&E contents available to the local professors and (2) redesign together with the local professors the local I&E courses so the online modules are delivered within them. The local staff was trained on the available contents as well as how to use the platform for online modules delivery, so like this they could lead the change towards blended learning in their home university and achieve local impact.

The main reasons for this shift towards blended learning from the EIT Digital point of view were: to ease the capacity build-up for the universities in the network (i.e., to train adequately the involved staff), to ease the implementation of EIT Digital-compliant courses by new partner universities, to create a 'backbone' around the I&E Minor and to reinforce the sense of EIT Digital and students' community within the Master programs. Additional benefits, resulting from the original ones, were harmonization of I&E education between the different universities [29,30].

With these aims in mind, 'going blended' projects for each university within the EIT Digital Master school were set in place, and all the universities in the network redesigned their I&E courses, from courses historically taught as conventional lectures courses, into blended ones. Here we present the different approaches we took for the course blending and we present several examples of blended classes from each approach. We also reflect on the teachers' involvement and feedback on the process.

3. How We Introduced Blended Learning

To introduce blended learning EIT Digital could not know beforehand which blended learning model among those possible were the best suited for each university. Depending on their legacy with regards to innovation and entrepreneurship education and on their current adoption of IT tools within their work processes, their need for specifications with respect to blended education varied. EIT Digital offered different models, from more to less loosely-coupled blending models, so that the choice made by university should, by design, optimize the switching costs/expected value balance from the university point of view.

Data collection. This context of networked partners using shared online contents has led EIT Digital to conduct a set of experiments and define blending models, so like this also understand the impact of the introduction of the blended I&E education and how the universities responded to it. To have comparable results and share lessons learned, the EIT Digital partner universities have conducted experiments based on a common frame for reporting the experiments' results. Drawing upon this methodology, the paper describes an approach to define blended learning models and strategies on how to implement harmonized I&E blended education in a large European network of universities.

The consortium organizes bimonthly coordination meetings in which different coordination aspects are discussed. To open conversation around the different implementation practices, as well as to inspire and raise awareness for use of online contents in contents different than traditionally used in the home university, in each bimonthly coordination meeting there was a 2 h workshop organized in which the teachers and coordinators showed examples of they used the online contents in their blended classes, if they use the online contents before, during and after the classes, as well as what kind of activities and assessment they usually use for them. We were asking the lecturers to send us the examples prior to the workshop and to also to present shortly how the students reacted to the methodology. All the examples are kept in dedicated repository available for the teachers all the time.

Here we present the models and blended classes examples resulting from the reports. The examples presented in the rest of the manuscript are originally borrowed from the actual implementations of the different universities in year 2018. In this year we had around 350 EIT Digital students spread out in the 18 partners of the university network and non-EIT Digital students are also admitted to the courses and follow the blended sessions together with the EIT Digital students.

We present the models from the perspective of a prospective university partner interested to join the network and how they can use and apply them when planning their blended learning implementation of the I&E courses. When they are presented to a prospective university, it is specified that the approaches are not exclusive to each other and that the teachers can also complement them between each other.

3.1. Flipped Classroom

Some universities in our network implement and use exclusively flipped classroom approach. In this approach the online contents are delivered before the class to the students and then discussed together with them in class. This approach requires minimal setup efforts (it required the availability of the contents on the platform), but required that the teachers get familiar with the contents, and feel comfortable to follow up on them in class together with the students.

In this approach the teachers used the in-class time to assess how students internalized the learning from videos, and applying immediately the learning on their projects/assignments. The presence of the teacher was focused on promoting the discussion among students and facilitating student to student interaction. The teacher were also sometimes involved in discussion initiated by students in cases when something is not clear to them (see Figure 1).

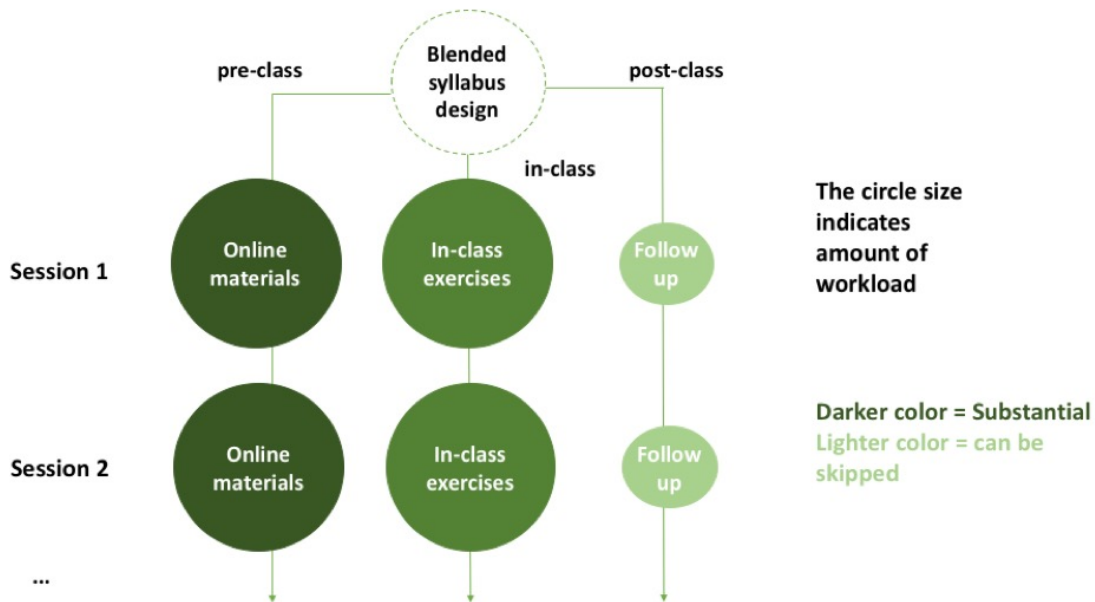


Figure 1. Visual representation of flipped classroom approach for blended learning implementation.

Example: Marketing and Customers Lesson

In this lesson example online video materias are provided to the students to prepare and get familiar with content. The eight videos of the module show the importance of customers and marketing for entrepreneurship. The pre-class material introduces the following concepts and frameworks to the students: Diffusion of Innovation, Drucker’s Marketing Concept, Value Proposition, Market Research, Marketing Mix, STP Model, Integrated Marketing Communication and Branding.

The class starts with a short recap of main principles and content, highlighting core content (for which the teachers uses a PPT presentation) Afterwards the teachers have a Q&A session where student can ask questions and use a case study to apply concepts in practice. Student work on the case in groups and at the end present their results and the class wraps up.

Additional videos (sales content) are offered to the students after class. The content is applied in projects, performed by the students in collaboration with start ups.

3.2. Full Blended Course

Universities that have bigger freedom in designing the courses usually offer full online blended courses: in them pre-packaged online contents (with assessments) are delivered to students before class and, in most of the cases, are associated with supervised sessions on the same topic in class. As in the previous approach, this means that the teachers needs to be familiar with the contents, and to follow them up in class. The principal role of teacher in this setting is to promote the debate among students, and this is either by introducing questions or specific non-main stream examples, which have not been included in the online modules (see Figure 2).

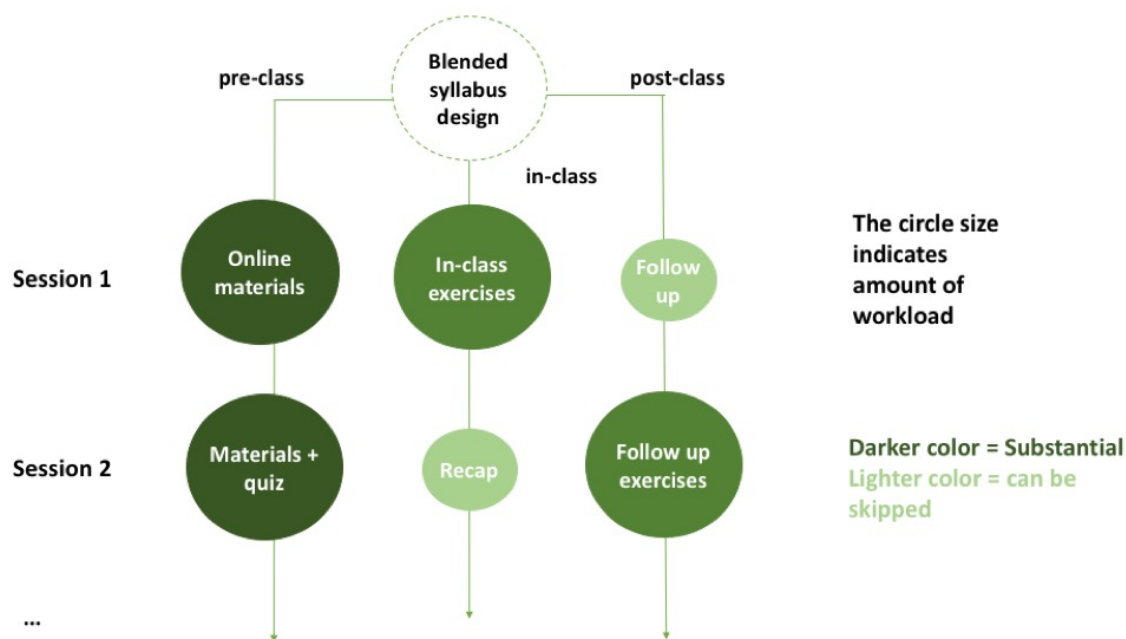


Figure 2. Visual representation of full online course approach for blended learning implementation.

Example: I&E Basics Blue-Print Course

The teachers for this course can use a blue-print structure composed of sessions with online contents to watch before the class and assignments for each module that students perform in class. Usually students have additional readings to do after the class. The sessions of the blue-print are the following ones:

1. Opportunity Generation and Innovation management
2. Validate Learning & Product Development
3. Customers & Marketing
4. Business model & Go-to-market strategy
5. Entrepreneurial finance
6. Organizations & Human Resources
7. Social Capital, Alliances & Networks
8. Value chain & IP
9. Growth & Exit

For the Customers & Marketing lesson some of the students in the universities where it was implemented commented that they really appreciated the way in which the subject matter was presented and used: the contents were presented before class and in class time they focused on role-playing. Like this the students first understood the key concepts via the online modules and then had the possibility to apply and learn through examples the concepts in class, one student commented: "I appreciated when we did role-playing, to understand from the business and customer perspectives".

3.3. Online Starter Kit

In courses where program coordinators have limited availability of the teachers, and no possibility to use online contents and blended learning in the course itself, for satisfying the blended requirement they can use online starter kits. The online starter kits are set of online pre-packaged modules with assessments which are delivered to the students before course, aiming to better prepare the students for the activity, and balance for the differences in knowledge the students might have as a starting point (see Figure 3). Here is the example of the online starter kit traditionally delivered to students to better prepare them for business modeling and development themes. The program coordinators

usually organize a 1h discussion session with the students, before the course, to follow up on the online contents and answer if there unclear aspects or questions.

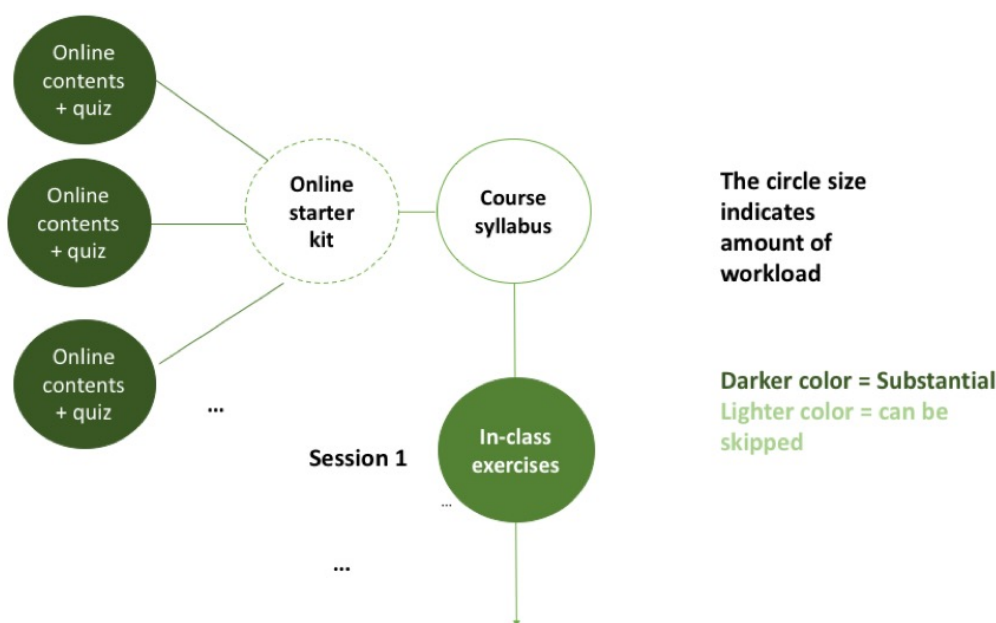


Figure 3. Visual representation of online starter kit approach for blended learning implementation.

Example. Business Modelling and Development Online Starter Kit

Before entering a course, the students need to finish the online starter kit aimed to prepare their knowledge for the course. This online starter kit is aimed at preparing the students for business modelling tools and consists out of three different sections:

- Introductory assignment, assignment intended to help the students understand what to expect from the course,
- Opportunity Recognition concepts, intended to help the students refresh the concepts already introduced on the topics of opportunity recognition in an earlier course,
- Business Modelling and planning, section intended to help the students come with a business ideas for the course. It also contains video modules intended to help the students improve their business planing skills.

Some students taking this starter kit commented that it took them between 1 h 30 min to 4 h to finish watching the videos and the related assignments. They found it to be well-spent time and highly educational experience. The industry business model provided as a last assignment caused vivid discussion online and students were bringing their (sometimes different) opinions about the proposed case and elaborated their comments further.

3.4. Independent Leveling Up

In some universities contents are delivered to the students before the class, they are usually accompanied with quizzes or assignments, which students have to complete, and then are not necessarily followed up in class. This is on purpose, with the aim to leave the in-class time available for invited guest lectures or practitioners or topics, and/or for any other planned activities with the students, such as visits of companies and startups, or participation to networking events.

In this approach the teacher had the highest degree of flexibility in terms of organization of the course. It required more time and efforts to setup it up the course on the platform, but did

not require the teacher to follow up on the contents in class. Additionally, it left space for bigger student independence and individual student time management, as well as 1-to-1 help and support on individual knowledge acquisition hurdles (see Figure 4).

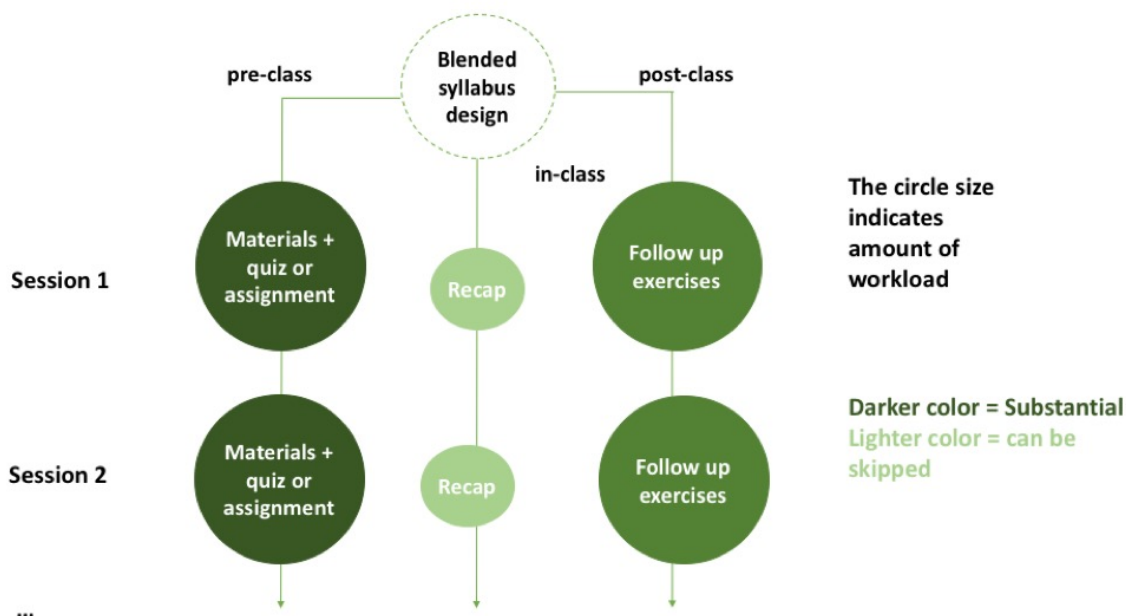


Figure 4. Visual representation of independent leveling up approach for blended learning implementation.

Example: Opportunity Management Lesson

In the first part of the class, all the important theories and main interdependencies are introduced to the students regarding the topic: Opportunity generation, Opportunity discovery, Opportunity creation, Serendipity, Juxtapositioning, the role of causation/effectuation, the role of prior knowledge. After the initial presentation of the teacher the class discusses together well-known examples of successful tech startups exploiting the different opportunity management in their working. Towards the end the class the students discuss an entrepreneurial case the teachers provides in teams and identify the elements discussed in the lecture. After the class the students are asked to watch all the videos on the platform which explain the theory and usage of opportunity generation/opportunity creation.

Some of the students commented that the online materials were useful to understand the meaning of the different terms like for instance: disruptive innovation, network effect etc. and watching the contents after the lesson helped to have better overall comprehension of the theme as well as more profound understanding of the examples and the usage of the presented opportunity generation strategies in real life scenarios.

3.5. Repository

Some teachers prefer using the online packages as a way to cover students' specific needs and open the modules as additions for classes they already run. In this scenario the teachers are trained on all available pre-packages for all of the courses of the I&E minor, and so they know how to make available to the students only selected subsets, and base their teaching on them.

In this approach the teachers have highest responsibility to closely follow the student progress and in a sense are responsible for the adequate (or non adequate) coverage of knowledge with online contents. It leaves space for student flexibility and personalized 1-to-1 personal support and guidance (see Figure 5).

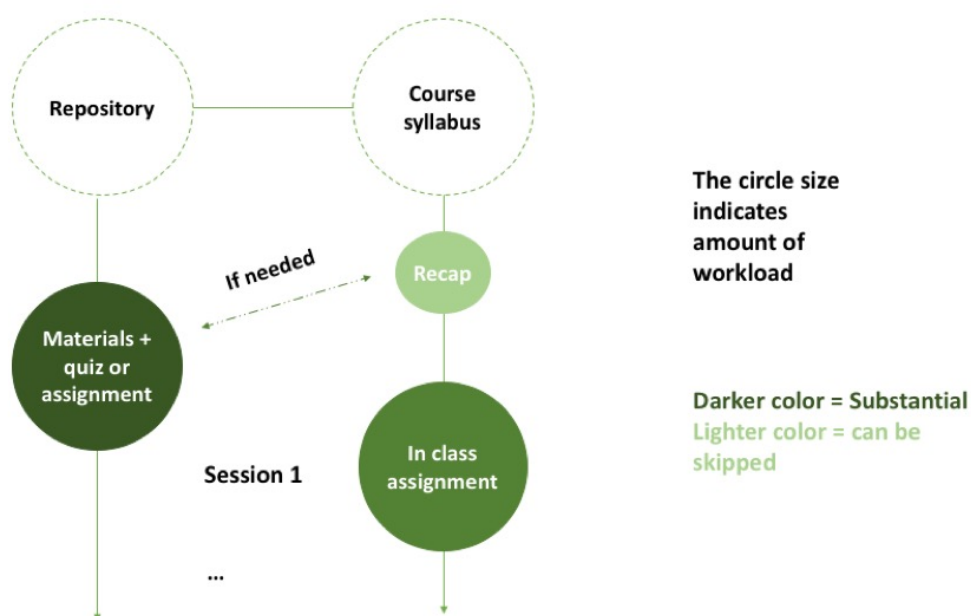


Figure 5. Visual representation of repository approach for blended learning implementation.

Example. Online Packages from the Library

To help our blending learning efforts we developed a set of full online session in the library in which the online contents are associated with quizzes and/or assignments, supported also with many hands-on examples from industry so to fully emerge student on a topic of interest. Teachers invite the students to watch the materials of only selected sessions relevant for the specific needs of the student in question.

3.6. Red-Thread

Our latest effort in this respect is the 'EIT Digital I&E Red Thread suite'. It is a set of online I&E contents packages in which all universities in our network deliver the same set of online modules across the I&E courses. It is a suite of packages covering the main EIT and EIT Digital themes and each session of the red-thread is composed of video materials and quizzes and peer-review assignments, leaving the possibility for each teacher to choose the assessment type of preference, and to better tune the delivery with the students' participants. The red-thread for now is supported only with these two blending approaches: flipped classroom and independent learning.

For the moment the red-thread counts of 13 sessions and it is intended that those sessions are spread out across the courses of the I&E minor: at the moment of writing of this article it is still in the phase of introduction to the universities.

4. Discussion

The way in which we introduced blending required students to be highly participative and teaching staff to design the classes in a way that could stimulate the students' interest. In the face-to-face sessions, the teachers needed to take care of both the on-site and on-line discussions and to guide students on-line after the on-site sessions. This also assumed a significantly heavier workload for the teaching staff. Our teachers told us that there were some activities that were in general "challenging" for the students and some that were in fact promoting for higher order thinking skills. Some used student participation statistics and assessment result reports as a base for making decisions about the design of learning and teaching activities. This is indeed the challenge of blended learning and there's a need for developing materials for both online and in-class activities that stimulate and activate

students. Also previous research shows that approaches that promote use of student activities had a positive relationship to academic success [31]. Indeed one of our next steps is to identify the optimal balance and interactions between these learning design activities for students, and how we can study the impact of these learning design activities on the overall effectiveness and quality of the approaches.

During the workshops our lecturers were often asked to reflect on when it's more appropriate in their view to use the online contents: pre, in, or post class and the difference they observed when introducing the contents in different parts of the class. Some had a preference to use always the same approach (for instance only flipped classroom), while some other said that for them it varies from the lecture topic and the contents available for the topic. For some topics they preferred to have the subject matter presented before class and then to have discussion and exercises in class and that other times for them it made sense to use contents after class as they provide the "big picture" on the domain. It is also that different blended models may be suited for different topics and for instance flipped classroom may work better for one topic whereas independent learning maybe be better for another one. The general opinion was that the modules need to be integrated well with project and/or course work so to make sense to the students, modules that were not fitting in the course syllabus were reported to not be relevant by students and they didn't see the practical use of them.

When asked if additional workshops would ease the introduction of blended learning in their syllabus, most of the teachers said that the visits and the workshops organized in the beginnings of the project were enough and that the teachers in general would have little additional time outside of the ones we currently organize. The teachers appreciated the exchanges of the experiences of the classes during the workshops and said that it promoted for better knowledge and pedagogical method exchange between the involved universities. The examples of the contents, show possible use, and the examples how to use them inspire them even more the use them. Through community of practice and working jointly they also learned from their colleagues from the other universities, expanded their perception of the body of knowledge and of its application, and opened themselves to perspectives outside of their home university.

To support the teachers even more in their efforts, we tried to have the modules coupled with additional materials on the topic of the modules for curious students and some extra activities that they can offer to them. To create guidelines that even more speak the language of the lecturers, we asked the lecturers to send few bullet points on how they used the contents for their teaching and included them in the packages.

The use of blended provided benefit for the students on the development of their soft skill as in class time provided more space for their exercises. One of the students in one of the lessons had commented: "I believe that an entrepreneur should also have soft skills like leadership, presenting and time management. Therefore, besides the training on how to perform an elevator pitch, I believe it would be helpful if all the students can write a personal development plan in which they state the skills they want to develop. After stating your personal plans the student can try to find other students who want to work on these skills as well. For example we can organise Virtual pitching labs, a brainstorm session via Hangout about time management or students who are interesting in finance can do a small project about start-up finance. During the skills sessions peers will give each other feedback and at the end of the skills sessions the student will reflect on the progress made, with the help of the provided feedback." Some teachers commented that the use of peer-review assignments was essential also for the development on writing skills and abilities and the use of peer-review was crucial for development of critical thinking and ability to give feedback, especially when in distributed teams [32].

Another concern from the teachers was that we should be careful not to overload students and the approaches should be giving the flexibility to the students to follow them at their own pace, still not to overload them.

The professors also told that the approaches worked better when the online contents were integral part (central part) of the course and not an add-on or loosely coupled to the course. This integration required some degree of forethought, work to do beforehand on planning and goal setting on the part

of the professors to ensure efficient and effective student use of online materials. The professors also told that the training on the online materials and on the platform performed in the beginnings of the project or in dedicated workshops was instrumental for this.

In some of the example lessons, the professors complemented and enriched the approach also with examples coming from their local educational context, like this personalizing the experience and exposing the international students to knowledge available locally. These examples were shared in the network and also other professors and students involved in the project were exposed to local cases and knowledge available at the other locations too. Some professors also reported to have created their own web pages to present additional training information to their students.

Some saw as a drawback of the general online education approach the lack of physical contact with the online lecturer. What we noticed is that it is good to have the possibility to get a hold of the “online lecturer” at least for a single physical session, so to compensate for the fact that students follow his/her lectures only online. In this line it also suggested by the teachers that the online learning approach and class delivery should be enhanced in continuity and that we should work more as a group to study how to spread of use of online contents between in class and out of class time, like this embedding the learning experience in also in the other spheres of activities of the students.

The global feedback from the partners about the implementation of these courses was very good. The online contents were uniting all the students in the various universities around the contents of the I&E minor around them and proved to be very compliant and adoptable to the different local contexts. The opportunity to accessing them was fully appreciated. Students feedback was in general positive, especially to the I&E red-thread, leaving great possibilities for developing cross-university collaborations and options for students to even more get to know the students part of the community. A student opinion “I think it would be interesting to organise a larger project, for one semester, which consists of teams with people from different EIT Digital universities. During this project you will get the opportunity to get to know more EIT Digital students and work on the business challenge idea. In my opinion this would help the students getting more out of the kick off business challenge and getting to know the other students from the EIT digital universities.”

The teachers also proposed ways how to evaluate the use of red-thread modules so that to be sure that they are even more harmonizing the I&E minor implementations across the universities and that they are bringing the expected value in the students. The options to evaluate varies from: questionnaires for students and teachers, asking alumni if the modules resonate with what they actually need from their work experience now, to an approach based on course performance and course evaluation, and this would be the next steps to tackle in our project.

Our implementation attempt shows that students have positive opinions regarding the use of the blended models as a learning methodology. Both, teachers and students acknowledge that the use of blended learning and the blended models promotes development of important competencies, the follow up and in class activities help reflection on the themes and application of the knowledge in real life scenarios, and the use of examples from the local context of each university can further enrich the educational offering. The main difficulty of implementing blended learning with our approach is in finding the right balance of learning materials to offer to the students (to not overload the student), as well as how to bring the online lecturer in the classroom. The shared contents were uniting the students from the various universities around them.

5. Conclusions

This article presents the modelling approach to our blended learning education and our experience to integrate online education into university instruction of the I&E group through pedagogical cooperation within the EIT Digital network of European universities. The approaches explained are based on the key concepts of the activity theory. We have also explained our further steps in this direction.

Our implementation showed that taking the approach of producing building blocks that are short and easy to reuse in different contexts, can bring for smoother adoption and provides flexibility in implementation of blended learning in such a large network of universities. We presented the different strategies to implement blended learning with such building blocks and the consecutive strengths and weaknesses of such implementation.

In one of our future works we plan to leverage on the blended learning education environment and study how to offer distributed students activities in which students physically located at distant universities collaborate with each other to deliver a case or a project. The idea is to ask the students to follow online lectures and then to ask the deliver case or project related to the theme in teams composed of students from different universities.

In another future work we plan to define a framework for measuring quality of our blended models. The aim is to study which relevant qualitative and quantitative indicators to use for this and how to measure the effect of the different blended learning methods on student achievement and development of skills and competences.

Taking into account all the difficulties universities face to set up entrepreneurship and innovation education programs, in this paper we have reported on the endeavor undertaken by the EIT Digital to set and implement blended learning within its I&E group, by creating the conditions for cross-university pedagogical collaboration with real impact on teaching. 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.

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