DEVELOPING ENGAGEMENT STRATEGIES IN THE BLENDED LEARNING TRIANGLE: THE CASE OF I&E EDUCATION IN THE EIT DIGITAL

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Abstract

Digitalised education is already a consolidated practice in Higher Education. Budget constraints and the need to target larger students cohorts show the benefit of leveraging educational content without increasing delivery costs. However, if on the one hand this “economy of scale” based rationale is the main foundation of the digitalised education narrative, on the other, such a view clashes with the need to address a series of novel social dynamics which are enacted by technological mediation.

This claim is rooted in a change of focus from just economies of scale to that of scope. When knowledge sources are diverse, fast-changing and interconnected, Blended Learning (BL) offers an opportunity to provide learners with a wide mix of contents which can be hardly owned by a single knowledge provider. However, in BL, the online part tends to drive its main value proposition, which turns out to be based on an efficiency-based view. On the other hand, positioning ICT as a means to produce complex educational content delivered to students interactively by trainers, transforms the traditional learner/trainer relationship into a three-dimensional learning environment made of content producers (CPs), class trainers (CTs) and learners (CLs), here referred to as the Blended Learning Triangle (BLT).

In this contribution we claim that these actors are traditionally seen as, somehow, disjoint. The question is whether such an interactional independence can be effective when dealing with complex knowledges instead of requiring a deeper engagement between them. This implies a problematization of the BLT, whereby these actors need to interact, cooperate and, plausibly, handle conflicts over demands of flexibility, adaptability and knowledge absorption capacity. This paper explores issues related to this problematization and, relying on experiences developed in the context of the EIT Digital, a pan-European network of HEIs, suggests possible recommendations to address these novel interactional demands.

Keywords: blended learning, disruptive innovation, digitalised education, new educational methods, learning economies, innovation and entrepreneurship.

1 INTRODUCTION: FROM “ECONOMIES OF SCALE” TO “ECONOMIES OF SCOPE” IN BLENDED LEARNING

ICT-mediated education, hereby referred to as digitalised education, is already a consolidated practice in education, and particularly in higher education (HE) [1, 2, 3, 4, 5]. The decrease in Higher Education Institutions (HEIs) budget and the need to target larger students cohorts clearly show the benefit of leveraging educational content without increasing delivery costs. If, on the one hand, this “economy of scale” based rationale is the main foundation of the digitalised education narrative, on the other, such a view clashes with the need to address a series of novel social dynamics which are enacted by these forms of technological mediation [6, 7].

Indeed, positioning ICT as a means to produce educational content delivered to students interactively by trainers, transforms the traditional learner/trainer relationship into a three-dimensional learning environment. Namely, these dimension are that of: (i) the producer that generates digital content, (ii) the trainer that interactively delivers it to learners, and (iii) the learner who has to engage with producers and trainers combining synchronous/asynchronous learning and online/onsite classes.
we claim, this statement is especially valid when dealing with complex and differentiated contents, which require flexibility, adaptability and effective knowledge absorption capacity [8, 9].

The motivation for this claim is rooted in a change of focus from just educational economies of scale to that of economies of scope. Indeed, when considering a specific instantiation of digitalised education, namely Blended Learning (BL), the combination of online and onsite content delivery opens up the opportunity to consider other value dimensions in the design of new digitalised learning environments [10]. In particular, a key opportunity is represented by the possibility of going beyond the traditional efficiency-based economy and content replicability. Therefore, a key value of BL does not lie just in the sheer replication of standardized knowledge, but also in the opportunity to provide access to a differentiated pool of complex and fast-changing contents [7].

This opportunity addresses an underlying twofold need. On one hand, such a need is justified by the increasing speed, specialization and multidisciplinarity in contemporary knowledge production dynamics and learning requirements. On the other hand, in a learning context characterized by multiple complex knowledge sources which require a systematic process of cross-fertilization, BL offers a plausible opportunity to provide learners with the needed mix of options which can be hardly owned and managed by a single knowledge provider [5, 6]. Indeed, our experience has shown that high levels of student and instructor satisfaction can be achieved with BL approaches, ranging from online assignments, flipped classrooms, continuous evaluation and follow-ups. However such an opportunity becomes workable only when the so called onsite class is not just viewed as a sheer extra layer to the digital component, but rather as the enactment of a social context in which digitalised content can be adapted, updated and framed to be effectively absorbed by learners.

As a matter of fact, when dealing with complex knowledge products, trainers have to engage with a wider set of knowledge producers. These have to rely and trust a wider set of trainers, and learners need to trust producers while recognizing the legitimacy of the trainer. In particular, the key challenge is that of enabling the “active participation” of students/class learners (CLs) and engagement in a cooperative effort with both content producers (CPs) and class trainers (CTs) who run the class. In BL, these actors play in a context which is different from both purely online and face-to-face/onsite education models. In particular, there are two main differences: 1) the CP is not necessarily the CT who uses the content, and 2) the CLs interact not just with the CT but also, indirectly, with the CP.

Indeed, if such a shift from economies of scale to economies of scope is to be enacted, while standardization would simplify the interactional pattern through the provision of highly replicable content objects, complex learning paths require a constant interaction by the actors at stake in order to ensure flexibility, adaptability and effective knowledge absorption. When content is complex, actors do find themselves in a problematic cooperation context which requires a deeper understanding and development of sound engagement strategies. The ensemble of such a complex dynamic is named, in this contribution - the Blended Learning Triangle (BLT), and will be further explored in the following sections.

2 STATE-OF-ART: THE NEED TO PROBLEMATIZE THE BLENDED LEARNING TRIANGLE

In the last years there has been a growing evidence on the positive impacts of digitalisation on HE [11]. Indeed, much of the existing literature confirms that an institution can be more efficient in delivering knowledge thanks to digital technologies [6]. The most common rationale reported in literature on why HEIs decide to take advantage of it is to maintain course quality in response to increasing cohort sizes and limited budgets [12]. It is clear that this claim implies an efficiency-based / economies of scale argument: namely that, due to limited resources and increased educational demand, especially in the HE system, digitalised education can achieve greater volumes (number of students) at a lower unitary cost (cost of content delivery).

Such an approach implies a second order assumption; de facto, economies of scale are possible in the context of replicability, and replicability requires standardization. Hence, as it can be noted in mainstream cases, the main focus of digitalised education is on standardizable content that can be replicated generating economies of scale [7]. Not by chance, when focusing on BL, the online part of it tends to drive BL strategies towards the delivery of highly standardizable contents. In a sense, the strongest value proposition of digitalised education is extended to BL which becomes a key component of efficiency-based educational strategies of HEI.
However, it is clear that the onsite part of BL introduces a third player in the education process, making a distinction between the CT and the CP which were traditionally overlapping. While in both traditional and fully digitalised education both roles are played by one single actor (either in the class or in a digital environment), in BL the digital part is performed by a CP while the offline part is performed by a CT.

These three actors are however traditionally seen as disjoint, with each of them having its own issues at stake - i.e. CP needs to produce good content; CT needs to be a good presenter; CL needs to be highly motivated and engaged. If this interactional “independence” is workable in a logic of highly standardized content, where the CP produces replicable content, the CT delivers it (with already studied methods on how to do so [13, 14, 15]), and the CL learns it [16], it is questionable if such a sequential logic can be applied in more complex learning situations. The question becomes whether such an interactional independence can be effective when dealing with complex knowledge contents instead of requiring a deeper engagement between the three actors and thus a problematization of their relationship.

In literature, such a case for BL to deliver more complex knowledge contents is clearly made referring to the need to have a closer look at its core value as rooted not just in economies of scale, but also and foremost in that of scope [9]. Indeed, it is hardly questionable that in the context of an environment characterized by the explosion of knowledge diversity and speed of change, the challenge in education is to provide learners with access to an increasingly diversified and dynamic “knowledges” pool. These generated economies out of diversity rather than volume, cannot be provided by a single knowledge source (e.g. the HEI), and are complex in nature. These circumstances imply a problematization of the learning triangle, whereby the three actors need to interact, cooperate and, plausibly, handle conflicts over demands of flexibility, adaptability and knowledge absorption capacity. Indeed, authors claiming about economies of scope do make the case that effectiveness is at least as much important as efficiency as both an issue and a value proposition.

This problematic issue is, however, not explored in existing literature. While effectiveness is mainly considered in terms of learning outcome evaluation [17, 18, 19], how such an outcome is achieved through the actuation of more complex engagement strategies between these actors is not given an adequate level of attention.

This is why the aim of this paper is to problematize the interaction between these actors in the context of an economies of scope view of BL and, by looking at real world learning situations, explore the issue of which engagement strategies can be enacted to deliver an effective BL environment that addresses issues going beyond scalability. Traditional approaches in blended education have usually not been taking into account the need for diversity and there have been only few examples relying on complex network of knowledge production. This is the reason why, in the current paper, we explore the existing relationships between the actors and give guidelines on how to design effective engagement strategies to support such complex scenario.

3 SETTING AND METHOD: BLENDING INNOVATION & ENTREPRENEURSHIP EDUCATION IN THE EIT DIGITAL

The current study takes into consideration courses held in University of Trento, Italy, in the fall semester - end of 2016 and beginning of 2017. The courses were given to students enrolled in two different types of Computer Science Master’s degree. Two lessons were part of the Innovation and Entrepreneurship (I&E) Basics course (a 1st year Master’s level course) and four part of the I&E study course (a 2nd year Master’s level course), both part of a minor in I&E [20], part of the double degree in computer science from EIT Digital [21]. Ten sessions were part of the professional Master’s degree on Technologies for Active and Healthy Ageing [22] offered by University of Trento.

We took an approach based on “active learning” where students were required to watch a set of videos at home prior to the class, and then concepts were further discussed in class together with group exercises. As a learning management system, all partner Universities of EIT Digital use Sakai, an open source learning environment used primarily for teaching purposes.

All the materials used for the study originate from the digital production of EIT Digital. Since 2014, six of the partner universities (KTH, Aalto, University of Trento, UPM, UPMC and TU Berlin) have produced more than 250 elements of online content (“nuggets”) covering all EIT and EIT Digital Master School main learning objectives with respect to I&E education [23]. The focus has been on common I&E topics (such as Finance, Marketing, Pitching, Organizations, Human Resources, Value
Chains, IPR, and so on) with every partner contributing to online contents based on their own specialization and competence. In average, the duration of a single video is around 10 minutes, and the videos come with assignments and slides to follow up the contents in class.

<table>
<thead>
<tr>
<th>Course name</th>
<th>Course Description</th>
<th># of sessions</th>
<th>Description of the set up</th>
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<tbody>
<tr>
<td>I&amp;E Basics</td>
<td>An introductory course where students are introduced to the basic concepts such as marketing, strategy, finance, HRM, IP management, economics, organisations.</td>
<td>2</td>
<td>160 active students part of the 1st year of the Master Programme in Computer Science. The two sessions were two independent lessons of the syllabus.</td>
</tr>
<tr>
<td>I&amp;E Study</td>
<td>The I&amp;E study course encourages students to incorporate their specific technical task line skills with the I&amp;E concepts studied during the I&amp;E minor. Students work on a case, and in the same time follow a set of 4 online modules delivered on I&amp;E topics, helping them to deliver their final project.</td>
<td>4</td>
<td>13 active students part of the 2nd year of the Master Programme in Computer Science. Besides watching the videos they also completed peer-review assignments after each module.</td>
</tr>
<tr>
<td>Active Ageing - I&amp;E minor</td>
<td>The purpose of the Advanced Course in Technologies for Active and Healthy Ageing is to create a number of professional figures with a wide variety of technical and social-health expertise. The course provides an I&amp;E minor in which students follow sessions on fundamentals of project management, business modeling, innovation and entrepreneurship.</td>
<td>10</td>
<td>19 active students part of a professional Master's level specialization on Active Ageing. All 10 sessions were held in two weeks time - one session each day.</td>
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During this study mainly qualitative data was obtained. Insights were gained by interviewing different stakeholders in the process: CLs, CTs and CPs. Two CPs, four CTs, and dozens of CLs were interviewed; observation notes were taken during and after the classes. The results of the experience were presented in the bimonthly I&E group meetings of EIT Digital, where all partners presented their insights from the EIT Digital 'going blended' project, aimed to extend the use of EIT Digital online contents in the implementation of the I&E courses in each University.

The feedback from CP was that the content preparation was quite straightforward. The CP was involved to prepare a set of slides and the respective scripts or narrative to explain in a clear way the lesson to the audience. Once the content assignment had been planned the major difference from a frontal lesson is in the necessity to record the digital content in a specific setting (a studio in front of a cameraman) without the presence of the classroom. Another difference was the attempt made from the CP to maintain the digital content concise, but still consistent, and make the lesson storytelling more engaging to students or addressee, as the digital mean leaves no control to the CP to check continuously the attention level in the classroom. The strategy of short digital modules helped the CL to maintain a good level of interest towards the educational content, without jeopardising their participation to the class but also to the overall learning path, and yet leave enough space (and freedom) to the CT to complement contents and allowed to integrate the learning methodology during the face-to-face phase.

The CTs participating in the study told us that if in traditional education, they felt as providers of knowledge, in the blended learning setting they were no longer bound to present instruction to the class and they had more time to dedicate on individual problems students had, observed students development and they had a role more of a coach then of a teacher. This also opened space for increased teacher-student interaction and CTs felt as they provided better individual coaching to each student individually.

With blended learning approach CLs felt that they have greater control over the learning process, and became active learners rather than passive listener. This change in role boosted their engagement and motivation, made them more responsible for the decisions, and made them responsible also over the blended learning process for the following generations, as they were asked to provide feedback on how to improve based on their experience.
In our setting we also had several attempts to study the interactions between the CPs, CLs and CTs. In three sessions, CPs came in class and took an active role, together with the CTs, in delivering the lesson. In this case the interaction between CPs and CTs was planned beforehand. Forums and discussions were set in place on the platform so that the dialog between the CLs and CPs was continued online. Additionally, we asked the CLs at the end of the courses to provide feedback to the CPs on the contents and suggestions on how it can better fit their needs. The dialog between CLs and CTs was observed consistently in all blended sessions. In the following paragraph, we further explore the relationship between the actors and we describe in detail the interactions we observed.

4 DISCUSSION

In the following section, we will explore the main issues that characterize the relationship between the three actors - the CP, CT and CL, in order to contribute to the development of effective and sustainable engagement strategies between them. The discussion is framed as follows: for each of the connections between these actors, we propose the key interactional issue, the problem from which it stems, related observations, a suggested recommendation for further work and improvement, as well as solutions which have been also piloted in the actual class setting.

CP to CT - Interactional issue: “ownership”

- **Observation:** Presenting content made by the CP without discussion and contribution of the CT delivers only very standardized, sterile and condensed knowledge without critical assessment. The CT should contribute with his own experience and provoke critical thinking on the students. The CT also needs to adapt the content to make it more relevant in the time and context the class is delivered;
- **Dilemma:** This is an issue which is revealed when the CP wants to make sure that the CT does not claim property on the digital content. CT might adopt the “lazy” approach to simply reuse content made by the CP in an attempt to scale his/her own class more easily without recognizing that actually both may have equally good level of expertise in the field. There would be a stronger benefit in combining both actors’ views and applying critical thinking to the content produced by the CP, which otherwise risks becoming a black box;
- **Piloted Solutions:**
  - Monthly plenary meetings (“I&E group”) between CPs and CTs to qualify positions, points of view and competences of CPs and CTs and to establish direct communication and trust.
  - Creation of a network of HEIs and teaching contexts in which CPs and CTs exchange roles.
- **Recommendation:** Establishment of constant dialogue and interplay between the CP and the CT, including a space where they can reinforce and empower each other.

CT to CL - Interactional issue: “recognition” / “legitimacy”

- **Observation:** If the BL content provides the only perspective on the subject-matter of a course, either because the blended component is mandatory or featured too prominently, the CLs might challenge the CT’s competence and not participate actively. Economies of scale are ensured, but economies of scope / effectiveness is lost.
- **Dilemma:** If CLs perceive the course as provided by somebody who is not the CT, an issue could emerge for which CLs assume that the CT is incompetent. This creates a dynamic in the classroom in which the CT is not taken seriously and illegitimized. In this sense, the baseline effectiveness of the class is compromised.
- **Piloted Solutions:**
  - Ask students to watch videos and find critical points at home and use it as a point to start class discussion.
  - The CT participates with his/her own position as well as complementing knowledge on the topic (content co-creation).
- **Recommendation:** Application of a co-creation approach to educational content by the CT. Goal is to ensure that CT’s views are also clearly stated in class.
CL to CP - Interactional issue: “accessibility”

- **Observation**: CLs just watch the videos, go through the content and complete exercises without evaluating it and putting it into use and understanding its place in the context of information they received;

- **Dilemma**: the CLs might see the CP as an “ontology”. They do not know who he/she is and / or assume that he/she is unreachable. This is a distorted view on the learning process, and leads the CLs to either assume that the content delivered by the CP is correct without space for critical thinking or that whatever doubt they might have will not be addressed. In this sense, learning becomes a matter of fact and is taken for granted.

- **Piloted Solutions**:
  - Have the CP interact directly with the class through forums, Q&A feedback or shared sessions. This breaks the virtual barrier which is put between CPs and CLs.
  - The CT should show that he/she is working together with the CP and should facilitate contact with CLs.

- **Recommendation**: Establishment of an ongoing dialogues between the CL and the CP facilitated in class by the CT.

The framing of this discussion is summarized in the following graphic representation (Fig. 1).

![Figure 1. Blended Learning Triangle Dilemmas](image)

Furthermore, another critical reflection related to the BLT emerges with respect to the recognition of the work done from the CP, which is somehow related to the content ownership and for which no solution has been piloted but here it is only proposed. CPs have been often involved only for a short time frame between the request of providing content on their specific expertise or area of interest and the conclusion of the recording phase. This may first and foremost disrupt their interest, but also hampers their effort in producing efficient and effective content to be used in BL. The education path designer, or the BLT responsible, who is typically the CT, should involve the CPs and agree on the whole course structure and modules from the early beginning. This would ensure a clear understanding from the CP of the entire learning path that the CL will follow, maximising the capability of CP to align his/her digital content to the overall content architecture. Moreover, the possibility to follow-up on what happens after the digital content has been provided to the CL could give a (positive) feedback to the CP, and so mitigate any potential issue on ownership and recognition which is a very relevant aspect as previously stated.

5 CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH: BL AND TRANSFORMATIVE DYNAMICS IN THE EDUCATION INDUSTRY

This paper aims to provide a further contribution to the exploration of the impact of BL in the evolution of HE. Analysing the concrete experience of a EU wide-network of HEI, EIT Digital, places our inquiry in the cross-domain between Computer Science and Innovation & Entrepreneurship. In the context of a society characterised by an increasing diversification, complexity and speed of change of knowledge domains, our analysis has been rooted within the research hypothesis that the core value proposition of BL shall not be confined solely in the search for educational economies of scale. Indeed, framing
such a value in the logic of economies of scope provides BL the opportunity to be positioned as a key dimension in the transformative dynamics that are occurring in the wider educational industry which is notably also driven by digitalisation.

According to this framework, the clear cut split between the roles of CPs and CTs on a wide and systematic scale, poses a series of interactional challenges in what here we refer to as the Blended Learning Triangle. Addressing these challenges requires the identification of a whole new mix of engagement strategies which can redefine the shape and design of that knowledge fabric represented by “the classroom”, a space that is now going beyond traditional organisational and geographical walls on the waves of both media and educational needs diversification. This contribution has been mainly conducted keeping the observation lenses on the main laboratory setting, once again the classroom. However, it opens up to reflections about the potential impact of BL at the macro-level, namely the educational industry. As noted by Clayton Christensen [24, 25], disruptive innovations are increasingly taking hype when a new player alters the overall shape of traditional value chains, creating novel value streams also through the destruction of consolidated power centres [26]. In the educational industry, this power center is well known and well grounded in historical resilience: the academic professor. The professor is an actor who entangles both knowledge production and delivery in the same role. Our question would be: if these roles are split, also because of BL, what happens to this actor? It is also to be noted that the space in the educational arena seems to be widening for education managers, professionals and practitioners. Such a challenge represents both the limitation and opportunity of this contribution which is too small to provide a sound hypothesis but hopefully able to call for additional reflections.

REFERENCES


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