Research report on state of the art in blended learning and innovation
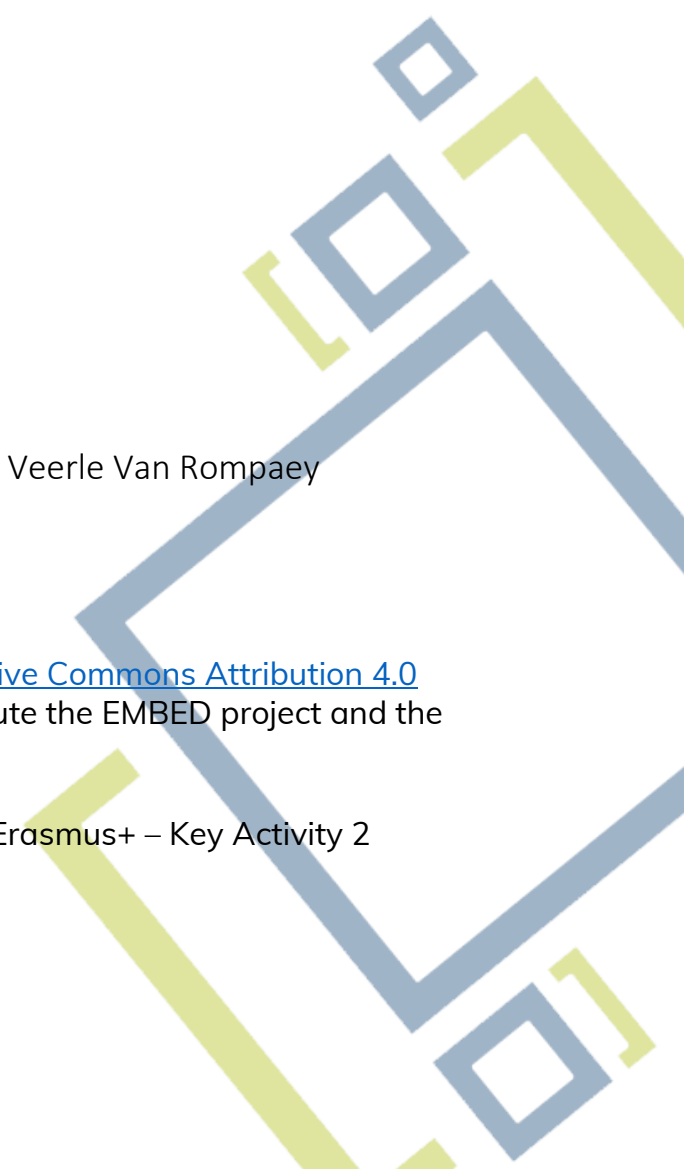
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European Maturity Model for Blended Education

1. The EMBED Project

In 2017, a strategic Erasmus+ partnership was established between seven organizations and HEIs: EADTU (coordinating body), Aarhus University (Denmark), Delft University (The Netherlands), KU Leuven (Belgium), University of Edinburgh (United Kingdom), DCU Ireland (Ireland) and Tampere University of Applied Sciences (Finland). During a period of three years (2017-2020) experts in the field of quality assurance, online and blended learning work closely together to achieve different objectives related to the introduction and sustainable implementation of BE. The 'European Maturity model for Blended Education' or EMBED project aims at:

- developing and validating a monitor for mapping blended learning practices, institutional strategies and governmental policies for blended learning across Europe, including criteria to assess their degree of maturity;
- empowering European HEIs in order to achieve up-scaled quality BL programs and courses by means of professional development activities and community building across institutional frontiers;

The project partners embrace a multilevel framework in order to tackle conceptual and implementation issues at the course level (micro), at the strategic level (meso) and with the intent to give relevant input to governmental policy (macro). Figure 1 depicts the different phases of the EMBED project:
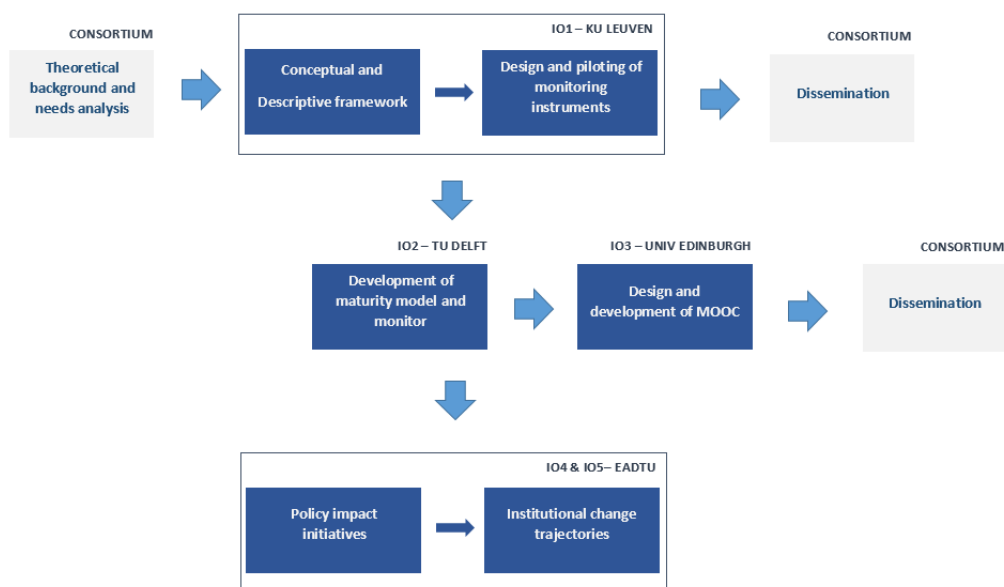

Figure 1 – Overview of the EMBED project

2. The iO1 Project Phases

The different phases of i01 (see Figure 2) aim at providing a framework and a set of instruments to scrutinize BL policies, conditions and practices. It is initiated by a review of recent literature, including (inter)national reports (e.g. Becker, Cummins, Davis, Freeman, Hall, & Ananthanarayanan, 2017), scientific publications comprising books (e.g., Anastasiades & Zaranis, 2017), articles (e.g., Mozelius & Hettiarachchi, 2017) and peer-reviewed conference proceedings (e.g., Cheung, Ma, Lee, & Yang, 2017). It allows the partners to agree upon a common terminology and a descriptive framework, as well as to define the focus and scope of the follow-up activities. The deliverables constitute the frame of reference for the remaining activities of the project. These include: (1) developing monitoring instruments, (2) collecting experts' views and making necessary revisions, before (3) piloting and mapping local BL practices.
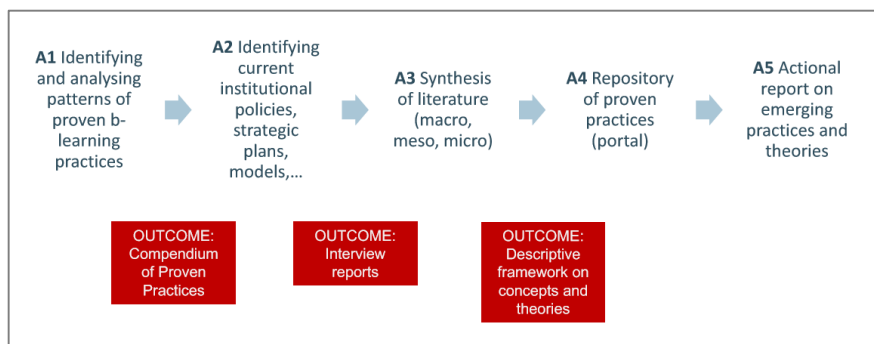

Figure 2 – Overview of iO1 project phases

Throughout the project the consortium is set up as an open, organic partnership of academic and non-academic coordinators, designers and developers with a special interest in online and blended learning (OBL), screening all instruments and documentation, and expressing and sharing their expertise, critical assessments and beliefs. Ultimate aim is to enable interested European institutions to define guidance and training needs and to set up/reform/optimize their BL strategies and practices which is piloted in the next project phases. This report includes the project deliverables for iO1.

In more detail, the iO1 project part has the following objectives:

1. To develop a frame of reference for QA of BL/BE, consisting of:
   o a conceptual framework with definitions and demarcations, dimensions and indicators
   o a descriptive framework regarding BE policies and strategies, next to BL practices of educators
   o instruments for a mixed method research design allowing us to map BE/BL in line with the conceptual and descriptive framework, i.e. the online survey and semi-structured interviews

DELIVERABLE 1: Review of literature report and a set of research instruments

2. To explore current BL/BE in a systematic, multilevel way by capturing governmental policies (macro), institutional conditions (meso), and practices (micro). This endeavor includes the following activities:
   o collecting quantitative and qualitative data within the consortium
   o mapping BL designs being marked as 'proven practice' against the descriptive framework
   o identifying the drivers and enablers of change which influence the implementation of BL practices and conditions
   o discerning typologies/levels of maturity by analyzing patterns and differences among the cases in a bottom-up manner

DELIVERABLE 2: A status of affairs' analysis regarding BL/BE in the partner institutions and a pilot testing of the research instruments

3. The iO1 Project Activities

1. Kick-off meeting (Brussels, Belgium)
2. Webinars: project meetings regarding deliverables 2 and 3
3. Visit TU Delft: meeting aimed at reviewing research instruments and visit to university services
4. Presentation at the EADTU Summit 'Innovations in blended and online education and virtual mobility' (see http://eadtu.eu/news/20-general-news/429-eadtu-eu-summit-2018)
5. Presentation at the EDEN 2018 Conference: 'Towards a European Maturity Model for Blended Education' (see http://www.eden-online.org/2018_genoa/wp-content/uploads/2018/05/genova-programme-booklet-v1.2.pdf)
6. Visit EADTU: meetings and preparing a draft of the project report
7. Transfer i01-iO2 meeting TU Delft and EADTU, including preparation training seminar (Brussels, Belgium)
8. Project meeting (Tampere, Finland)
9. Training seminar (Tampere, Finland)
10. Training seminar (Brussels, Belgium)
11. Training seminar (Antwerp, Belgium)

DELIVRABLE 1 - LITERATURE REVIEW

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GLOSSARY

Blended learning (or hybrid learning): learning as a result of a deliberate, integrated combination of online and face-to-face learning activities.

Blended teaching (or hybrid teaching): the design and facilitation of blended learning activities.

Blended education (or hybrid education): the formal context that is determined by policies and conditions with regard to the organization and support of blended learning courses and programs.

Course design: the planning and design of the course structure and with the process, engagement, interaction, and evaluation aspects of the course (Eom & Ashill, 2016, p. 196).

Curriculum: a series of planned events that are intended to have educational consequences for one or more students (Eisner, 1979, p. 39)

Formal learning intentional learning activities that are structured in terms of time, space, goals and support in order to develop knowledge and competences (adapted from Kyndt, Gijbels, Grosemans, & Donche, 2015, p. 1113).

Learning analytics: the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs' (Siemens, 2012, p. 4).

Learning environment the setting and natural environment in which teaching and learning occur (Hew & Cheung, 2014, p. 111).

Learning a process through which adaptive competence is acquired by constructive, self-regulated, situated and collaborative formal or informal learning activities (adapted from De Corte, 2010).

Learning design: a methodology for enabling teachers/designers to make more informed decisions in how they go about designing, which is pedagogically informed and makes effective use of appropriate resources and technologies. This includes the

design of resources and individual learning activities right up to whole curriculum level design (Conole, 2013, p. 121).

Program design: the organization, planning and documentation of a structured series of courses or units

Media selection choosing the appropriate means of physically delivering the information to users (…) in print, online, through video or audiotape, or through a live connection (Carliner, 2000, p. 566).

Student engagement the time and energy students devote to educationally sound activities inside and outside the classroom, and the policies and practices that institutions use to induce students to take part in these activities (Kuh, 2003, p. 25).

1 INTRODUCTION

The rapid development of internet-based media and technologies during the past 25 years have changed considerably higher education (HE) in terms of flexibility, adaptability and accessibility of courses and programs (Wallace, 2003). Virtual learning environments and (massive) online courses have replaced traditional distance education (Perry & Pilati, 2011), while blended learning (BL) has been cited as the future *'major instructional movement'* (Yen & Lee, 2011) or the 'new normal' (Dziuban, Graham, Moskal, Norberg, & Sicilia, 2018). As findings have showcased the multiple affordances of BL for different stakeholders in HE, its demand increased. The 2017 Horizon Report (Becker, Cummins, Davis, Freeman, Hall, & Ananthanarayanan, 2017) labels BL as a 'foregone conclusion' in HE and emphasizes the importance of effective BL designs and strategies:

> *If institutions do not already have robust strategies for integrating these now pervasive approaches, then they simply will not survive. An important step is tracking how these models are actively enriching learning outcomes.* (p. 2)

However, despite its popularity particular conceptual and operational problems induce important challenges to scholars and practitioners, among others those responsible in higher education. As Laurillard (2015) pointed out in her critical report, the 'demand for quality HE is not being met on the current model' (p. 30). University policy makers and administrators, curriculum developers, as well as teams of or individual instructors are confronted with questions related to: 1) the set-up or redesign of quality BL programs and courses and 2) the institution-wide implementation of BL and matters of its continuous quality improvement (CQI). BL scenarios often do not comply with the local context they are implemented in: learners' expectations are not in line with the set-up of BL courses, or staff is not recognized for online teaching efforts which supplement, complement or replace classroom activities. As a consequence, BL projects fade out and high student dropout numbers are rather the rule than the exception. On the other hand, even when at organizational level the requirements are met, completion rates remains an apparent problematic issue in BL (Deschacht & Goeman, 2015).

On the one hand, BL is ambiguously defined in literature and there is no unified view (Graham, 2013; Graham, Woodfield, & Harrison, 2012). On the other hand, it remains unclear in what circumstances implementations are successful, or not. Among others, Sloman asserted in 2007: 'We must understand more about what motivates learners, what support they need and how these supportive interventions can take place in practice. Only with understanding can we get the "blend" right.' (p. 315).

Moreover, according to Torrisi-Steele & Drew (2013) there is 'a need for further research into understanding not only why academics may choose to engage in blended learning, but also, once engaged, why some choose to integrate technology to create transformative blends while others choose minimally impacting blends (…) this is problematic in terms of formulating the required professional development and support' (p. 371). In terms of monitoring and quality assurance, concrete data stemming from countries or at different action levels regarding BL is missing and focused information is dispersed and fragmented. The past decade, BL has been widely adopted in HE and the extant literature has grown consistently, still few studies provide guidance for institutions (Halverson, Graham, Spring, & Drysdale, 2012) and there is lack of multidimensional indicators. An integrated micro-meso approach can be found in Mazohl & Makl (2017), for example, but no validation is presented.

In the following paragraphs we first try to entangle the building blocks of blended learning and education. We develop a conceptual framework on the basis of theoretical considerations and empirical evidence, and argue in favor of a contextualized approach when studying and reporting BL/BE. Secondly, we unfold how BL and BE can be designed, planned and organized. Next, we discuss some important research findings that shed a light on BL/BE from different perspectives. A final section is dedicated to quality assurance models and frameworks.

In short, the first part of the project applies the systematics of scientific inquiry in order to answer conceptual as well as operational questions that arise from BL practice. In this way we hope to provide a guiding resource both for those investigating BL practices and those developing or supporting BL, consisting of: (1) a conceptual framework with definitions and demarcations, and (2) a descriptive framework regarding blended education policies and strategies, next to blended learning designs. It allows scholars and practitioners to conceive studies, to develop research instruments, to map practices or to initiate planned changes and (re)designs, in line with a common evidence-based framework.

2 FRAMING BLENDED LEARNING AND EDUCATION

Is BL about mixing e-learning with traditional learning, or online with face-to-face learning, mixing media, mixing theories of learning, or about mixed contexts, mixed learning objectives or mixed pedagogics, or... something else?

2.1. A brief review

Different authors define BL as being (delivery) systems, formats or methods that combine face-to-face instruction with computer-mediated instruction (Graham, 2004). Some scholars, for example Peres, Lima and Lima (2014), add to this definition particularities regarding the role of the instructor or the (a)synchronicity of the delivery mode. According to Graham (2006) a plethora of BL definitions exist, with either delivery media or instructional strategies at the core. In their editorial of a journal's special issue on blended learning Denise Whitelock and Anne Jelfs (2003) refer to four additional contrasting interpretations: (1) the integrated combination of traditional learning with web-based on-line approaches, (2) the combination of media and tools employed in an e-learning environment, (3) the facilitation of individual study and group work through the use of on-line tools and (4) a combination of a number of pedagogical approaches which is not necessarily dependent on the use of learning technologies. The first definition is widely used (e.g., Alammary et al., 2014; Halverson et al., 2012; Picciano, 2007). Others refer to a blend of resources, job tasks, face-to-face and technology-mediated interactions or instructional technology (Bliuc, Goodyear & Ellis, 2007). In the context of training-related research Adams, Hanesiak, Morgan, Owston, Lupshenyuk and Mills, defined BL in 2009 as 'a combination of various instructional modalities integrated with synchronous and/or asynchronous web-technologies to facilitate interactive, reflective individual and collective learning' (p. 6). In many instances, the term 'blended learning' is used synonymously to refer to hybrid learning (e.g. Cheung, Fong, Zhang, Kwan, Kwok, 2014; O'Byrne & Pytash, 2015; Pecot-Hebert, 2012; Vernadakis, Antoniou, Giannousi, Zetou, & Kioumourtzoglou, 2011). Often, the concepts of 'teaching' and 'learning' are employed interchangeably in definitions, for example in Embi, Nordin and Panah (2014): 'Blended Learning is the teaching practice that interconnects traditional face-to-face mode of teaching and Web-based teaching and learning' (p. 1). Or, as Alkhatib (2018) mentions: 'an integrated teaching mode that combines face-to-face and online learning activities' (p. 21).

According to Voci and Young (2001) the concept of BL 'has emerged with the onset of e-learning, or learning that is delivered across the Internet' (p. 157). Others such as Young (2002) label BL as a 'convergence of online and traditional instruction'. In her systemic analysis of 2015, Laurillard circumscribes BL as the 'integration of digital technologies with conventional methods of teaching and learning' (p. 10).

Delialiogly and Yildrim (2008), as well as Buzetto-More and Sweat-Guy (2006) indicate that the core of BL is about evoking student learning by means of a 'hybrid approach to instruction'. Accordingly, Ward and LaBranche noted BL involves 'learning events that combine aspects of online and face-to-face instruction' (2003: 22). Also Halverson et al. (2012) refer to BL as a design of teaching that combines online and face-to-face instruction. Both Steffens and Reis (2010) as well as Gedik, Kiraz and Ozden (2013) emphasize in their definition the integration of online and offline learning activities or, respectively, 'face-to-face (F2F) learning experiences and online learning' (p. 1). Different authors emphasize the dichotomy in learning spaces present in the BL approach:

1. ' (…) regular face-to-face learning with technology-based online learning by dichotomizing the total class time into a distance or a web-based learning portion and an in-class or face-to-face meeting portion' (Olapiriyakul & Scher, 2006, p. 288)
2. ' (…) learning processes that are spread across face-to-face and on-line contexts' (Ginns & Ellis, 2006, p. 53)

Often BL is being referred as providing 'the best of two worlds'. According to Osguthorpe and Graham (2003) one should be 'using the web for what it does best and using class time for what it does best' (p. 227). Vernadakis, Antoniou, Giannousi, Zetou and Kioumourtzoglou (2011) define BL as 'a new course delivery style (…) that combined the best features of online learning and traditional classroom learning' (p. 188). Watson (2008) ascertains that BL is a 'new, robust instructional approach that takes advantage of the best elements of both settings' (p. 4).

2.2. Towards a common language

As pointed out in the previous paragraphs, literature on BL embraces a wide variety of conceptualizations. There is still no clear-cut definition, BL is a container term in some instances. This has led to divergent interpretations among educators or coordinators and across institutional contexts, thus, one designs and develops courses, programs and policies based on one's particular (limited) understanding of the concept (Alammary, Sheard, & Carbone, 2014; Mestan, 2019). As a consequence, some authors discern different kinds of *blends*, based on particular characteristics of the delivery medium, e.g. using mobile technology to consult a course management system during a face-to-face meeting (Lee & McLoughlin, 2010) or specific learning objectives (e.g., O'Byrne, 2010; Singh, 2003). Oliver and Trigwell concluded in 2005 that definitions of BL are inconsistent or redundant, and that some efforts of defining BL not even refer to instruction, teaching or pedagogical methods.

Driscoll (2002, p. 1) argued correctly 'the point is that blended learning means different things to different people, which illustrates its widely untapped potential'.

First of all, we deem that reducing BL to particular outcomes of teaching and learning, specific media and tools, or services, is not helpful. For example, web components are part of a larger set of internet-based applications and services which can be supplied and distributed among (groups of) learners. Likewise, interaction is part of a larger set of activities at the disposal of the instructor. Lastly, within both virtual and real-life spaces, teacher and learner roles can be diversified. Both self-paced or instructor-led activities can take place. It is not per se the space that will define which roles instructors and learners take up, it is determined by the instructional design.

Secondly, it seems important to reclaim ICT infusion in education as a proxy for BL. We need a 'convincing and practical pedagogically-driven (as opposed to technology-driven) methodology' regarding the infusion of ICT in BL environments (Conole & Oliver, p. 4). In this regard, Ross, Morrison and Lowther's (2010) argue that educational technology 'is not a homogeneous "intervention" but a broad variety of modalities, tools, and strategies for learning. Its effectiveness, therefore, depends on how well it helps teachers and students achieve the desired instructional goals.' (p. 19). Communication scientist Pierson (2003) argues that it is appropriate to detach the functions of ICTs from the technical tool. Also Betty Collis (1999) and Dillemans, Lowyck, Van Der Perre, Claeys and Elen (1998) suggest not to list technologies but to examine 'what the user can do with them', i.e. their functionalities. A similar distinction, called 'work' and 'technology', can be found in Kanabar (2001). Gráinne Conole (2013) speaks about 'affordances'. She asserts that identifying 'the positive affordances of technologies and any associated constraints can then be used as a means of making informed design decisions in terms of using a particular technology in a specific learning context' (p. 89). When deciding upon ICT infusion while designing BL courses 'comparing the characteristics of different tools' (…) aid instructors to 'focus on the actual use of a tool in a particular context rather than the tool per se'.

Thirdly, the lack of conceptual consensus, next to missing validated frameworks for research, design and implementation causes confusion and hampers furthers developments and reporting in the field. This ambiguity has impeded research for a considerable amount of time. Scholarly contributions did not report transparently nor consistently about the characteristics of studied BL approaches. BL designs and results are hard to replicate or generalize (Graham, Henrie, & Gibbons, 2014). In this regard, as Onguko, Jepchumba, and Gaceri (2013: 618) asserted, BL 'should be defined with consideration of the contextual realities as well'. By informing more in detail about what is given, and what is targeted in the educational practice, as well as the operational definition of the concepts, the level and unit(s) of analysis, the underlying basic learning theory (behaviorism, cognitivism or constructivism) or pedagogical principles one provides the keys to controlled interventions and replicative studies. Typically, these components are highly context-dependent and determined by institutional or program elements such as the strategic mission and view on education, the curriculum goals, the revenues, available support and supportive services, among others.

By being more explicit, a de-synthesis of complex research and analysis of data on BL courses and programs become feasible.

More and more, scholars have tried to step away from *ad hoc* reflections and derived comprehensive frameworks from theoretical and empirical considerations. Osorio Gómez and Duart (2011), for example, frame meticulously their study's background, purposes, methodological design and (interpretation) of results, on the basis of socio-cultural activity theory. They analyze BL environments (BLEs) in terms of learning activities, mediating artefacts, subjects and their interactions. In Kerres and De Witt (2003), the authors present BL as a thoughtful mix of different didactic methods and delivery formats. They outlined three critical didactical components which specify BL 'arrangements': (1) content, (2) communication, (3) construction. The delivery format is chosen based on these didactical decisions. Trentin and Bocconi (2014) unravel the 'key components of hybrid solutions' (p. 12). They discern onsite/online learning spaces and individual/collaborative learning processes as being dimensions for BL designs. In the same year, Stein and Graham published in 2014 their 'standards-based' guide to blended learning, an easily accessible aid for course designers. More complicated, because theoretically-grounded in multiple disciplines, is the hybrid learning model proposed by Tsoi (2009). Other prescriptive instructional models were developed by Alonso, López, Manrique and Viñes (2005), for HE in particular by Hack (2016). Singh presented in 2003 different dimensions and delivery methods of blended learning programs. A large part of this work builds further on Badrul Khan's Octagonal Framework for e-learning. A decade later, Jeanne Lam (2014) proposed the TIPS model to cover the context of blended learning from a technological, institutional, pedagogical and social perspective.

Others described patterns of BL found in practice. Mohamed Embi and others (2014) compiled a comprehensive reference book of cases of blended and flipped learning in Malaysia. Graham, Allen and Ure (2005) give an extended overview of BLEs, their benefits and challenges. Twigg (2003) distinguished five models that are used in higher education: supplemental, replacement, emporium, buffet and fully online. The OECD (2018) discerns three types:
(1)   The flipped classroom: learners are assigned homework relevant to the next session and then practice this content in the classroom.
(2)   The lab-based model: a group of learners rotate between a lab or classroom to receive/reinforce/enhance content with the content applied through face-to-face interactions with the teacher.
(3)   'In-Class' blended learning, in which individual students follow a customized schedule rotating between online and face-to-face instruction.
Horn and Staker (2014) defined four models of BL: (1) rotation, (2) flex, (3) à la carte, and (4) enriched virtual. Within the rotation model there are four subcategories: station rotation, lab rotation, flipped classroom, and individual rotation.

Yet other authors focus on studying critical factors impacting design and implementation of BL in HE. Mozelius and Hettiarachchi (2017), for example, identify ten categories. These are situated at different levels, among other the institutional and the individual e.g. (continuous) acceptance and use of technology, computer anxiety technical pre-knowledge and personal innovativeness. Furthermore, a couple of course-level factors (didactics, course design, collaboration and social presence, synchronicity, as well as societal factors (technological trends and hypes or economic situation) are specified.

2.3.   The DNA of Blended Learning and Education

Our understanding of blended learning and education are elaborated in the following paragraphs. In line with Garrison and Kanuka (2004) we oppose a time-based approach i.e. a course or a program is labeled 'blended' if a certain percentage of it is conducted online (Allen, Seaman & Garrett, 2007) due to its operational complexity. Unlike Helms (2004) we consider courses that use (web)links or other online resources to supplement face-to-face learning as being blended. We oppose also to using the concept of 'traditional' as expressed by McCray (2000), Voci and Young (2001) or a panel of experts during the Sloan-C Workshop in 2005 (see Picciano, 2005). On the contrary, we retain the idea of BL courses that encompass learning activities 'in a planned, pedagogically valuable manner', 'where a portion (institutionally defined) of face-to-face time is replaced by online activity' (Laster, Otte, Picciano & Sorg., 2005 as cited in Picciano, 2009: 10). We opt for BL as being learning instigated by deliberately integrating online and face-to-face learning activities in line with Garrison and Vaughan (2008) who frame BL as 'the organic integration of thoughtfully selected and complementary face-to-face and online approaches' (p. 148).

Vanderlinden (2014) speaks about 'replacing seat time in courses with online activities to achieve learning objectives' (p. 75). In accordance with Stein and Graham's 'Essentials for Blended Learning' (2014) we delimitate 'blended courses as a combination of onsite (i.e. face-to-face) with online experiences to produce effective, efficient, and flexible learning'. Or as Bliuc describes BL (2007: 242): 'learning activities that involve a systematic combination of co-present (face-to-face) interactions and technology-mediated interactions between students, teachers and learning resources'. As Mozelius and Hettiarachchi (2017) put forward: 'blended learning could be seen as the continuum between traditional face-to-face teaching and pure online distance courses'. In se, BL is partly characterized by a geographical and/or temporal separation between instructor and student, mediated by internet technology (Ananthanarayanan, 2004; Holden and Westfall, 2010).

In line with Littlejohn and Pegler (2007), Quillen (2010), Zhao, Lei, Yan, Lai and Than (2005) we believe that if BL is too broadly defined, all learning is blended learning and conceptual overlaps are created.

We argue that blended learning design involves not 'just adding on to the existing dominant approach or method' (Garrison & Kanuka, 2004: 97). We agree with Helms (2014) that 'this new format of learning has unique instructional design elements and considerations, just as face to face classes and purely online classes have unique concerns' (p. 804). To arrive at effective teaching and learning across physical and virtual contexts, course designers and curriculum developers are challenged to link instructional strategies of distance and contact education, to create and sequence learning experiences in virtual and physical spaces, to converge and merge online and face-to-face didactical actions in a seamless manner.

> The definition of blended learning that we favor is: *learning as a result of a deliberate, integrated combination of online and face-to-face learning activities*. Instruction encompasses activities which the educators organizes and implements deliberately, in order for learners to be able to achieve stated educational objectives. This implies a design apt to provoke learner behavior in line with particular goals and fitted to the institutional context. In BLEs, trainers or teachers get learners to engage in blended learning activities by means of an instructional approach that address intended learning outcomes. Consequently, we define blended teaching as *designing and facilitating blended learning activities*. Blended education refers in our opinion to *the formal context of BL (practices) that is determined by policies and conditions with regard to the organization and support of blended learning*.

2.3.1.   Integrated combination

In our definition, 'integrated combination' refers to a contextualized logic for structuring learning and instruction using a 'blend' of virtual and physical spaces.

Blended courses provide the opportunity for teachers to mix the best of onsite and online to create a learning environment for their students. Thomas Skill and Brian Young (2002) speak of 'integrated learning environments', i.e. 'a blended learning experience that combines in-class teaching and learning modalities with robust electronically mediated experiences' (p. 25). Ellis and Calvo stated in 2007 that BL is about 'a systematic mix of e-learning and learning in face-to-face contexts, in which coherence across the two contexts from a student perspective is achieved (…) the most optimal balance between online- and human-mediated educational interventions in a particular context' (p. 61). Or, as Boelens, Van Laer, De Wever and Elen (2015) put forward: 'a deliberate combination of online and classroom-based interventions to instigate and support learning' (p. 2).

Both instructional design and learner behavior are dependent upon context-specific elements regulated by the HEI (e.g. curriculum specifications, pedagogical approach,

operational factors). Moreover, instructional conditions (teaching design) have an impact on learners' usage of BL resources (Bos, 2016).

This implies that blended learning, teaching and education involves always a contextualized logic for learning and instruction across human-mediated (physical) and technology-mediated (virtual) spaces, expressed as a particular sequencing and proportion of online and offline learning activities.

A first, distinct feature of a BL approach is the specification of online learning activities as preface, extension or complement to face-to-face learning activities (Figure 3). BL programs on the other hand obtain a unique character due to their particular balance of online and onsite courses (Figure 4).

Preparation

ON → OFF

Duplication

ON ↔ OFF

Extension

OFF ON
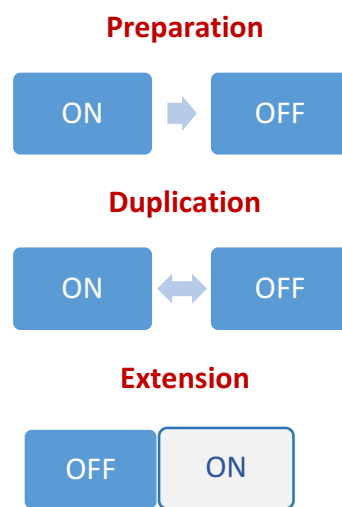
Figure 3 – Sequencing of offline and online learning activities

In 2015, Montrieux, Vangestel, Raes, Matthys and Schellens from University of Ghent (Belgium) reported about three different scenarios of applying web-based lectures: (1) as a preparation for face-to-face practical exercises, (2) as a repetition of parts of the course, and (3) as an extension of the course. These were implemented in different content areas: Geography, Biology and Mathematics, in particular to allow students to get familiar with GIS software program (online) and release time for in-class exercises (scenario 1), to deepen their knowledge of particularly difficult topics by means of short online lectures (scenario 2), or to prepare for exams by means of pre-recorded videos with worked out examples (scenario 3). The Portuguese University of Aveiro has developed a module regarding distance education targeting postgraduate students (Pombo & Loureiro, 2013). It is part of the PhD program on Multimedia in Education. It is organized as a four-week blended course with one onsite session at the beginning, followed by online sessions and a session at the end where the students meet face-to-face. Learner support and feedback are organized by means of wikis, social network sites and the course management system (CMS). Martyn (2003) described a successful blended learning course. It consists of an initial face-to-face

meeting, weekly online assessments and synchronous chat, asynchronous discussions, e-mail, and a final face-to-face meeting with a proctored final examination.

Dziuban and Moskal (2001) reported that blended courses at the University of Central Florida replaced face-to-face class time with online learning so that a three-hour course occupied only one hour of actual face-to-face classroom time. Such courses allowed the weekly operation of multiple classes in a classroom previously occupied by only one course.

BL programs are (customized) approaches, delineated by a particular sequencing and integration of online and onsite courses. They are in line with the program objectives, target group and institutional conditions. A program design for blended learning links the educational, curricular or program objectives and main features of a program to the actual BL opportunities offered by the organizer of the BL programs. Based on existing examples we distinguish 4 typologies: switch, learning network, development and continuous. They differ in terms of sequencing of the delivery mode. The number of sequences can differ, as well as the total duration of the program.
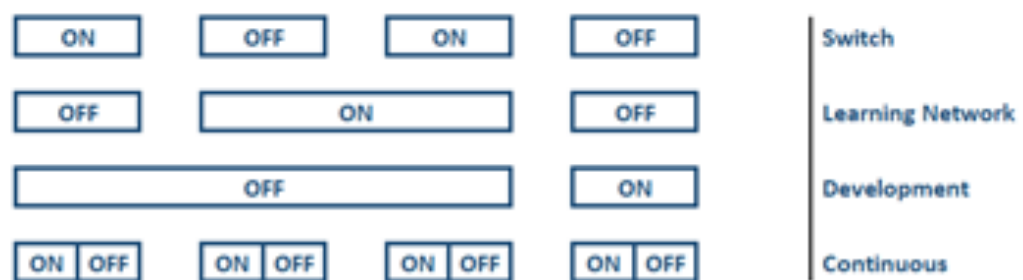
Figure 4 – Sequencing of offline and online learning courses

At the University of Leuven in Belgium the so-called 'micro masters' and 'micro master programs' are composed of online courses (via edX) that can be taken in preparation of an on-campus master. If a student passes the exam he obtains credentials that eventually gives access to an accelerated university program afterwards. Such programs serve also PR purposes; if satisfied students are more eager to continue their studies at the same HEI. The educational program for nurses and nursing students at the South Korean Chu-Ang University (Cho & Shin, 2014) is built as follows.
- 15 hours of online instruction with web-based learning materials
- 15-hours of off-line instruction: review of core contents of the online part during lectures (3 hrs), case analysis and group discussion (9 hrs), miscellaneous activities a.o. the evaluation of the program (3 hrs)

At the Tampere University of Applied Sciences (future) teachers can take up a 60-credit blended Vocational Teacher Education program. It comprises of six modules, subdivided into themes. Students are part-time learners, they meet each other face-to-face one day every two weeks. The remainder of the learning activities is organized

online, in small groups. At the start of the program, 6 months later and at the end of the one-and-a half year program all learning activities take place on campus (during 3 weeks). All other sessions of the program are available online, though students can also opt for the face-to face alternative.

Either they need to travel to campus and meet with the teacher and (some) class mates face-to-face or to follow the sessions from home or any other location. As a consequence, the educator is either present in a classroom, or will join the class groups online.

Part of the University of Edinburgh's educational approach is based on Student-Led, Individually-Created Courses (SLICCs). First- and second-year undergraduates can earn 20 academic credits during their summer holiday for experiences gained during a self-selected professional development program, an internship, work experience or a research project. Aim is they develop their own set of skills and attributes, reflect on their experiences (blogs), link with peers (community) and demonstrate how they achieved the learning outcomes (reflective report) – they need to demonstrate *what* they learnt, *how* and *how* they would continue working in the future. On three occasions they get formative academic feedback (proposal-interim-final stage).
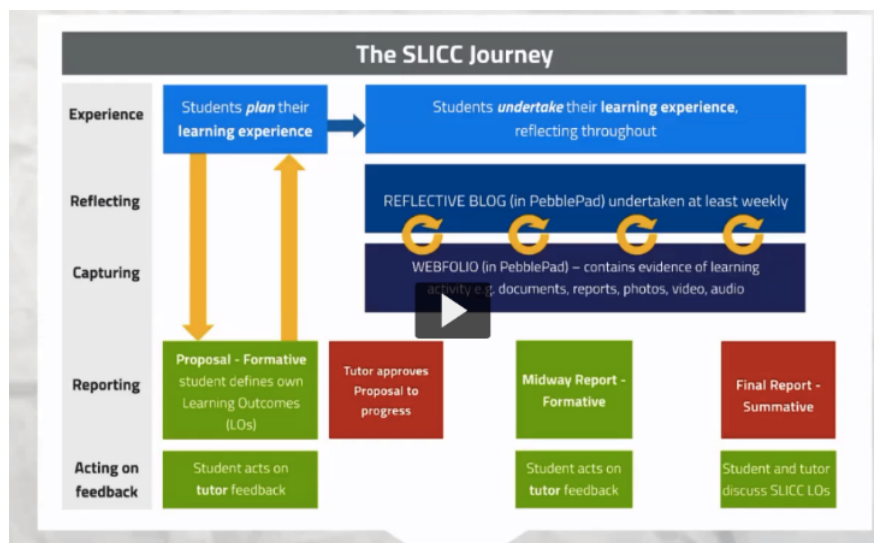
Figure 5 – Screenshot of SLICC approach at University of Edingburgh

2.3.2.   Deliberate

In our definition, 'deliberate' refers to the role of instructional and program design in order to achieve observable, intended (learning) outcomes. BL activities, courses and programs are to be thoughtfully designed prior to their development and implementation. A second, distinct feature of a BL approach is the specification of the proportion of online and offline learning activities by means of a design.

In this regard, Shea (2007) proposed a grounded model for blended environments which 'avoids the dogmatic application of specific instructional methods, forces us to articulate the basis for instructional choices, and provides a firmer foundation for curricular and pedagogic decisions in blended environments' (p. 35).

BL course design entails five stages:
1. Stating assumptions, beliefs and epistemologies about the nature of learning;
2. Identifying the theories of learning and instruction that underpin stage 1;
3. Articulating the pedagogical approaches
4. Specifying instructional strategies
5. Designing learning activities

These design decisions are accompanied by reflections on technology-mediated learning, in particular in relation to emotional, motivational and cognitive aspects of learning.

Van den Bossche, Verliefde, Vandenbunder and Vermeyen (2012) piloted two scenarios of web colleges as a manner to implement 'guided independent learning' at the University of Leuven: (1) in addition to or as an alternative to seat based lessons (duplication), (2) as a preparation for a skills lab (preparation). During the first pilot each lesson of a one semester course on Physics and Mathematics in an undergraduate engineering course was recorded and made available immediately after the face to face moment. During the second pilot web colleges were integrated in order to prepare nurses-in-training for their practical lab sessions belonging to their undergraduate program. Instructional videos with different media designs demonstrating skills were created by a team of lecturers and uploaded. Omar Alkhatib reported recently (2018) in detail about a BL approach in the form of flipped classrooms (see also https://flippedlearning.org) to apply constructivism and conversation theory in engineering courses. Pre-class learning resources are combined with a wide array of class materials. These include: (1) interactive lecture modules with brainstorming questions, lecture theories, and short exercises and problems (documents and video clips), aimed at independent learning (pre-class); (2) mini-lecture video reviews, either web colleges or screencasts, for pre-class reviewing or in-class use while notetaking or revising course contents after class; (3) tutorial videos for previous review out of class (e.g. software training); (4) online quizzes related to preparatory work, revision, homework or assignment. Shibley (2011) applied the information system design framework ADDIE model (analysis, design, development, implementation, and evaluation) to systematically design a blended chemistry course for a larger group of students.

A program design for blended learning links the educational aims and main features of a program to the actual blended learning opportunities that are provided to learners by the institution. In line with Falconer and Littlejohn's view on 'design for learning' (2007) we define program design for BL as *the organization, planning and documentation of a structured series of BL courses or units*. The design process is initiated in order to develop a novel program or to re-engineer an existing program. The outcome of the program design process articulates the overall instructional approach, the concerned resources and services at the program level.

There is no one-fits-all instructional design for a blended course, neither is there a template for effective learner behavior, nor is there one successful program design. De George-Walker (2010) emphasizes there are endless successful combinations, as many as there are individual students.

With hybrid (re)designs of courses the policies and conditions for organizing and supporting learning and instruction, i.e. the *blended education* context, is necessarily adapted. For example, notions of seat time and online time are to be integrated, as well as 'time on task' (Skill & Young, 2002). In line with the 'hybridity' of learning spaces, research regarding BL practices should include a different approach. As Nynke Bos (2016) stated on page 65 of her PhD study:

> *'(…) learning data analysis in a blended learning setting needs a different approach compared to data analysis in fully online courses (Agudo-Peregrina et al., 2014). One of these approaches is to take into account the attendance at face-to-face activities, since large parts of the educational activities in a blended learning setting still take place in a face-to-face setting (Allen & Seaman, 2014). Analogously to learning data analysis, with registering page clicks or page visits, one should then also register lecture attendance. So, besides trace data from the online learning activities and contextualized data about learning strategies one must also obtain attendance data to investigate a blended learning course, rather than only the online aspects of the blended learning course.'*

2.4. Benefits and Challenges

2.4.1. Learning effectiveness, efficiency and satisfaction

Protagonists of BL have claimed that it has the potential to impact learning effectiveness, learning efficiency and satisfaction. Dziuban, Hartman and Moskal (2004) suggest that BL approaches combine the effectiveness and social dynamics of a classroom with the sheer endless technological opportunities for active learning in an online environment. Melton, Graf and Chopak-Foss (2009), for example, found that hybrid health course designs were preferred over traditional delivery. Their results further indicated learners performed significantly better in the blended format. Voices such as Dziuban and Moskal (2001, 2005), Lamport and Hill (2012) and Thai, De Wever and Valcke (2017) reported that BL reached equivalent or higher effectiveness than other formats. BL is considered to enhance social connections between learners (Summers, Waigandt & Whittaker, 2005), to achieve higher learning effectiveness and to result in cost savings (Cohen & Nachmias, 2009; Dziuban, Hartman, Juge, Moskal & Sorg, 2006; Osguthorpe & Graham, 2003). Alla Nazarenko (2014) introduced a BL format for a language course at a Russian University. The knowledge content was supplemented by a VLE, a learning community was present, regular assessment

integrated, while students could study in a more convenient manner than in the former traditional lecture course. Nazarenko found BL to contribute to the transformation of learning and to the efficacy of learning due to permanent student activity.

Galway, Corbett, Takaro, Tairyan and Frank (2014) studied the outcomes of a flipped classroom in public health HE. They observed that students achieved similar examination scores, but rated their course satisfaction more highly and reported an increase in self-perceived knowledge. Another study in the field of health education (Woltering, Herrler, Spitzer, & Spreckelsen, 2009) reported significantly higher scores for motivation, perceived learning gains and satisfaction among students in a blended scenario of problem-based learning. Some studies refer to deeper, more meaningful understanding of course contents, better learner engagement and being forced (to learn) to take responsibility for one's learning process (Dziuban & Moskal, 2011). Ginns and Ellis (2007), focus on student perceptions in a BL context. They developed a questionnaire to capture the multi-faceted structure of students' BL experiences. They convey that students' perceptions of assessment, workload, independence, the quality of teaching and clarity of objectives are related to the quality of learning and learning outcomes. This focus on students' perceptions is also present in a study of Mestan (2019). It considers both the student and academics' perspective and concludes that a blended approach seems to enhance students' engagement. Students who are satisfied with the BLE highly value well-organized online material, and would like to see the LMS to be structured in a linear way. Often, reports make reference to enhanced learning and improved or more regular interaction as benefits of hybrid formats of teaching and learning. Some authors wrote they achieved to create a more student-centered learning environment and a vibrant learning community with more teacher-student, student-student or student-content interactions (Lopez, Ayuela, Gonzalez-Burgos, Serrano-Gil, & Lalatsa, 2018; Nortvig, Petersen, & Balle, 2018; Søilen, 2007; Tudini, 2018).

A lot less research is dedicated to the study of the impact of BL on learning efficiency, 'the learning outcome or knowledge gain in relation to learning time' (Renner, Weitzel & Laumer, 2014: 3). Learning efficiency can be measured as learning outcome per learning time (see Rasch & Schnotz, 2009). Baepler, Walker and Driessen (2014) asked if they 'could trade contact hours for an active learning pedagogy and environment and achieve the same student experience and learning outcomes'. Their findings demonstrate 'that in an active learning classroom, student faculty contact could be reduced by two-thirds and students achieved learning outcomes that were at least as good, and in one comparison significantly better than, those in a traditional classroom' (p. 227). A different approach was followed by Wai and Seng (2014) who explored the efficiency of BL tools in teaching and learning.

Critical note to these findings, however, is that effectiveness studies about BL tend to include additional learning time, instructional resources, and interactive course elements, which may lead to confounding relationships of these variables on the (positive) outcomes (Means, Toyama, Murphy, & Baki, 2013). Voos (2003) suggested that it is unlikely that the 'blendedness' makes the difference in such courses, but

rather the fundamental reconsideration of course design in light of new instructional and media choices and the learning strengths and limitations of each.

Stein and Graham (2014) listed some reasons why BL courses are considered as effective or more effective than their online alternatives: (1) improved instructional design, (2) increased guidance and triggers through resources, activities, and assessments, (3) easier access to learning activities, (4) individualized, self-directed learning opportunities, (4) increased motivation and engagement through social interaction and (5) students' time on task. Moreover, as Castaño-Muñoz, Duart and Sancho-Vinuesa (2014) showed previously, only if the greater proportion of online time is devoted to interactive learning activities it will improve academic achievement. Additionally, McNaught, Lam and Cheng (2012) state:

> *Both the provision of rich learning resources and the engagement of students in online communication appear to relate to learning (acquisition of knowledge and skills, and enhancement of learning motivation). However, we also found that, in general, the amount of time students spend on these resources and activities is less important than the quality of the learning activities themselves. For example, resources should excel in clarity and relevance; activities should promote active learning and interactions.* (p. 284)

Henrie, Bodily, Manwaring and Graham (2015) asserted also that 'clarity of instruction and relevance of activities influenced student satisfaction more than the medium of instruction'.

2.4.2. Accessibility, flexibility and inclusiveness

Policy makers and practitioners emphasize the importance of blended learning as a leverage for accessibility, flexibility and effectiveness of tertiary education. Broadly speaking there is evidence that ICT-enabled education can give greater opportunities for accessing lifelong learning (eUser, 2005; HELIOS, 2005, 2006; Ala-Mutka, Malanowski, Punie & Cabrera, 2008). Due to the online part BL courses and programs are convenient and contemporary 'beyond the traditional confines of the classroom' (Stein & Graham, 2014). Typically, because of the wide range of online media employed for delivery of study materials, collaboration, assessment and coaching authors refer to a higher flexibility and inclusiveness of education.

Convenience and instructional flexibility are reported as benefits for educators (Garrison & Kanuka, 2004). Educators are able to use innovative teaching methods addressing different learning styles and target groups, with more variation in instructional strategies, and higher effective use of class time. Learners can profit from more learner-centered approaches and tailor-made contents of education. BL courses and programs are particularly convenient for those students who have other commitments that are time-and space-bound such as jobs, family or hobbies, or those

who live in remote areas, or have specific learning needs. They offer opportunities to accommodate their (busy) schedules, allow them to follow a flexible study scheme and to commute less due to reduced classroom contact hours (Driscoll, 2002; Dziuban et al., 2004; Poon, 2013; Shea, 2007).

Blended learning offers opportunities to create flexible study programs to a growing population of learners with professional or family obligations (Dziuban, Moskal, & Hartman, 2005; Park & Choi, 2009; Vignare, 2007). This flexibility especially appeals to mature, postgraduate and international students, who seek out learning opportunities tailored to their specific context (Afip, 2014; Inoue, 2009). In this regard, offering BL courses and programs may be used as a marketing strategy in order to reach new student markets, with increasing enrollments as a consequence.

At the institutional level better cost-benefit outcomes were reported (Boora, Church, Madill, Brown, & Chykerda, 2010), due to a lower demand or more efficient use of campus infrastructure (Dziuban & Moskal, 2001). From a managerial point of view, some processes are run more efficiently due to automated documentation and online interactions for administrative purposes.

2.4.3.   Learner disengagement and dropout

In contrast with the rhetoric on enhanced, tailored learning experiences and higher accessibility for learners, studies indicate (severe) problems with retaining or satisfying learners in blended courses and programs. Compared to traditional, class-based education the levels of drop-out seem to be significantly higher (Lee & Choi, 2010; Park & Choi, 2009), or certain already disadvantaged groups of learners are left behind, e.g. disabled, unskilled, long-term unemployed. Deschacht and Goeman (2015) scrutinized the impact of the introduction of a blended learning format on students' persistence and performance and found BL led to better exam results and higher course pass rates but failed to improve persistence of individual lifelong learners. This phenomenon has been related to course-related factors, next to factors situated at the individual, program or institutional level (Vergidis & Panagiotakopoulos, 2002; Arsham, 2002; Xenos & Pierrakeas & Pintelas, 2002).

A learner is expected to show adequate online and offline behavior in order to succeed. However, the 'DNA' of the design does not always compel to students (e.g. Montrieux et al., 2015). A series of articles report about no significant differences in learner's achievement, nor satisfaction between blended and traditional courses (e.g. Delialioglu & Yildirim, 2008).

Educators are concerned about the workload due to preparation and management of courses and/or additional online activity but also about the attitudes and behaviors of online student who do not work up to the standards asked (Omar, Kalulu, & Alijani, 2011). Unfortunately, accounts such as Stott (2016) about low engagement levels, poor grades for students and poor student evaluations for the online instructor are numerous.

Among others, the narratives of an American professor (Reardon, 2016) who teaches writing via online and blended courses to freshmen (p. 33):

> *The primary difficulty all of us had was maintaining student*
> *engagement. We all sensed student detachment in one form or*
> *another, either through uncommunicative, listless classes during the F2F*
> *meetings in the blended classes, or lack of consistent communication*
> *through email replies to instructor queries.*
> *(…)*
> *In fact, many students commented that they would have preferred to*
> *enroll in a traditional section because they need someone to help make*
> *them accountable. (…) Many seemed aware that blended sections*
> *require a high level of responsibility and self-directional skills that most*
> *of our (…) students do not possess. My students did tend to want to*
> *disconnect, but they also had insight into their behavior and needs, and*
> *in the end, they knew that they would do better with more supervision*
> *and personal attention. (…) I have found that online sections of English*
> *1120 are successful for older, more responsible students, but not for*
> *younger, incoming freshmen who are still learning basic college skills.*

2.4.4.   Lack of self-regulation and instructional disobedience

Academic success in a BLE seem to require adequate self-regulation skills, i.e. motivation (self-efficacy and goal orientation), Internet self-efficacy, time management, study environment management, and learning assistance management (Lynch & Dembo, 2004). Learners may lack the abilities to thrive in these environments, and do not take appropriate decisions.. They have poor and even negative prior learning experiences, low motivation to get involved in learning, and finally, lack the much needed prior knowledge and skills to complete the course or program in a satisfying way. Reardon (2016) conclude in his article 'because success in FYC depends on interaction—with the instructor and with fellow students—the challenges of engagement and interaction in an online course may prove too difficult for some first-year students' (p.

Students do not always comply with the instructional design which leads to behavior that defies from what is expected. It is frequently reported that learners underuse particular media and tools or learning aids (e.g. Lust, Vandewaetere, Ceulemans, Elen, & Clarebout, 2011; Narciss, Proske & Koerndle, 2007), or neglecting learning opportunities as foreseen in its design. Tackling 'instructional disobedience' and 'non-compliant students' (Elen, 2013) is, therefore, one of the great challenges of instructional designers and program coordinators of BL courses and programs.

In sum, Table 1 tabulates the benefits and challenges related to the adoption and diffusion of BL practices in HE:

Table 1 - Benefits and challenges of BL in practice

Level of observation	Benefits	Challenges
MICRO (learners and educators)	• Performance, effectiveness • Satisfaction and perceptions • Interaction and engagement • Course flexibility	• Instructional disobedience
MESO (institution)	• Program flexibility / accessibility / inclusiveness • Cost / benefits: automated enrolment, administration, delivery, assessment, revision	• Dropout

3 Blended Learning in Practice

3.1. Design of BL courses

Setting up or reengineering BL courses demand a (re)consideration of their instructional design (see for example Adams, 2013; El-Mowafy, Kuhn, & Snow, 2013; Goeman & Fairchild, 2016). Basically, one should find out how to combine the best features of both formats or 'to retain the benefits of face-to-face teaching and class interaction as well as capturing the benefits of virtual learning' (Mitchell & Honore, 2007: 143).

This instructional approach is captured in a *learning design*, eventually made explicit by means of a type of representation, by Conole (2013) labeled as follows:
- practice-focused (e.g. case studies, lesson plans and patterns);
- conceptual (e.g. mind maps and metaphorical representations);
- abstract (e.g. models and vocabulary);
- technically orientated (e.g. UML 1 diagrams).

Furthermore, as Conole (2013) explains and illustrates in greater detail, such a representation:
- has a particular format: text-based, media-based, graphical, numerical, or a combination
- specifies a design at a particular level: from small-scale learning activities to a whole curriculum
- provides a 'lense on the inherent design': either nature of tasks, associated tools and resources, or the overarching pedagogical principles

3.2. From context analysis to media selection

Table 2 presents the different steps to be taken and the ground(s) of decision that will guide the BL design. The complete process encompasses 4 iterative phases.

Table 2 – The ground(s) of decisions and design of BL practices

Phase	Decision ground	Design phase
1	Context and curriculum specifications	Set up the blended learning environment • **What is to be learned?** - define learning objectives and contents at course and program level • **Who is involved?** (learner and instructor characteristics) – define the attributes of the LE • **What resources are available**? – assess the implementation and change conditions that shape the teaching and learning context
2	Learner, program and instructor profile	Determine flexibility at course and program level • **To what extent** is flexibility offered? - determine one or more categories and dimensions of flexibility?
3	Learning theory / Instructional design model	Define learning activities and their sequencing in line with learning objectives: • **Which learning tasks are offered**, composed by the didactical components content, communication and construction and what is their grouping (individual-vs group)? • **What learning activities will take place online, which onsite, in what order?**
4	Learning activities and media affordances	Choose media and/or tools for delivery and organization of the learning activities: • **Which media and tools are employed**? – determine as a function of media affordances (ergonomy and synchronicity),

3.2.1. Phase 1: Getting started: Set up of the BLE

We consider learning as a process through which adaptive competence is acquired by constructive, self-regulated, situated and collaborative formal or informal learning activities (adapted from De Corte, 2010). The pedagogical core of a learning environment, i.e. a 'setting and natural environment in which teaching and learning occur' (Hew & Cheung, 2014, p. 111) in HE is constituted of four interrelated elements (OECD, 2018): (1) learners (who?), (2) teachers (with whom?), (3) content (what?) and (4) resources (with what?).

Prior to setting up the BLE, a thorough context analysis aids to specify what is to be learned, and who will be involved. This includes defining objectives and contents at the program level (what is to be learned?), on which the course goals and contents are based. Moreover, learner profiles are key to specify the attributes of the BLE. Learner characteristics are typically assessed by means of intake questionnaires or interviews with items related to socio-demographics, personal circumstances with regard to study, private life and job, technological proficiency and attitudes, study motivation and expectations, previous educational experiences and/or learning strategies or self-directed learning readiness (see Nikitenko, 2009).

This information can be supplemented with research evidence or with results from academic and learning analytics. Illustrative for the first mentioned (*evidence*) is Stijn Van Laer and Jan Elen's study 2017 study in which seven key attributes of BLEs are identified that support learners' self-regulatory abilities. These include: authenticity, personalization, learner-control, scaffolding, interaction, cues for reflection and cues for calibration. Follow-up research of Van Laer and Elen (2018) leads to new insights how BL design can alter self-regulation behavior of learners. Finally, information about instructor characteristics and their instructional strategies aid organizations to determine professional development and support in line with the tasks required by the educator competencies and roles in the BLE (Alvarez, Guasch, & Espasa, 2009). Boelens, Voet and De Wever (2018), for example, scrutinized differences in instructors' strategies for differentiated instruction and beliefs about designing BL to address student diversity. As a result they discern three profiles: *disregard*, *adaptation*, and *transformation*. Accordingly, they conclude 'the three profiles (…) can be used by organizations and instructors to reflect on their own practice, to become more aware of their own beliefs, and to adjust their teaching approach' and 'it is important for organizations to develop a clear stance on this issue, which pays explicit attention to proactively planning differentiated instruction' (p. 207). The last mentioned source of context information (*analytics*) allows to keep track of and visualize different aspects of technology use patterns, teaching and learning behavior at the individual or group level, as well as to plan and assess interventions aimed at adjusting teaching and learning processes and BLEs (Dietz-Uhler & Hurn, 2013; Rienties, Boroowa, Cross, Kubiak, Mayles, & Murphy, 2016; Verbert, Duval, Klerkx, Govaerts, & Santos, 2013). In this regard, the emerging field of *adaptive learning analytics* holds many promises (Mavroudi, Giannakos, & Krogstie, 2018).

A third crucial aspect to consider are the (institutional) conditions (Osguthorpe and Graham, 2003) for implementation and change, including managerial aspects, organizational culture (e.g. Alebaikan & Troudi, 2010) and strategic foci (see Chapter IV).

3.2.2. Phase 2: Determine the course and program flexibility

In accordance with the previously mentioned components the course and program flexibility is set, in other words, it is decided to what extent (cohorts of) learners are free to process through a program or a particular course in terms of categories of flexibility dimensions. Bergamin, Ziska and Groner (2010) put 22 theoretical dimensions in seven clusters. We regrouped these and reconsidered some in other to discern flexibility at the program and course level (see Table 3)

Table 3 – Flexibility of a Blended Learning Environment (adapted from Bergamin, Ziska & Groner, 2010)

Course-level category	Dimensions
Time	* timing of teaching and learning (asynchronous/synchronous) * duration of learning * pace of learning (speed)
Place	* localization of teaching and learning (in-class/out-of-class)
Space	* teaching and learning space (online/offline)
Material	* paper-based/virtual * language
Activity	* group size (individual/group, small/mid-size/large) * self-regulation (independent/dependent)
Content	* choice of topics * theoretical vs practical orientation of topics * focus of topics * path of learning (order)
Program-level category	**Dimensions**
Provisions	* extent of program adaptation * extent of learner-instructor communication * technical infrastructure * logistics of learning materials
Requirements and regulations	* entry requirements * forms of examination * time of examination

3.2.3. Phase 3: Define learning activities and their sequencing

Defining learning tasks happens in line with the learning goals/objectives of a course and the curriculum. Typically, both tasks and learning goals are classified in taxonomies (see for example Anderson & Krathwohl, 2005; Alkhatib, 2018). Task sequencing is associated with a particular view on how to instigate and support learning, inspired by a learning theory, instructional design model and/or pedagogical principle(s). Like Montrieux et al. (2015), different authors base their BL course (re)design on the principle of Constructive Alignment of Biggs (see for example Reaburn, Muldoon, Bookallil, 2009). This stipulates that course design is focused on aligning the intended learning outcomes with the learning activities and testing type(s). Yet others, e.g. Mazouin (REF.?), advise to link course outcomes and learner satisfaction.

In Kerres and De Witt's highly cited article of 2003, BL is presented as a thoughtful mix of different didactic methods and delivery formats. They outlined three critical didactical components which specify BL 'arrangements', hence, learning activities: (1) content, (2) communication, (3) construction. The learning objectives of a course determine the relative weight of the three components in blended learning arrangements and, as a consequence, how much time learners should spent with activities related to the three kinds of learning activities.

A course designer selects an offline/online mode based on what will best deliver and scaffold each learning activity. The choice is rooted in considerations about costs in terms of effort (dedicated time and complexity). The sequencing of online and offline learning activities is accorded to the types of (meta)cognitive and/or motivational processes in which the learner has to be engaged, based on a particular learning theory (e.g., constructivism), instructional design model(e.g., 4C-ID, First Principles) and/or pedagogical principle(s) an instructor adhere to. As a result, the 'DNA' of a blended learning design (Figure 6) can be represented by a (unique) string of particularly sequenced online and onsite learning activities, defined by the task character (content, communication, construction) and their grouping.
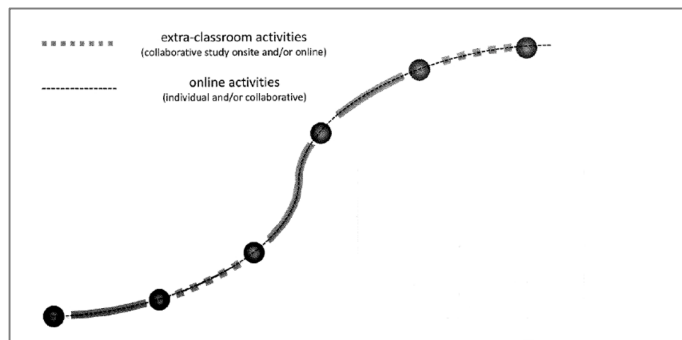
Figure 6 – Sequencing of online and offline (partim from Bocconi & Trentin, 2014, p. 4)

3.2.4. Phase 4: Choose media and/or tools for delivery and organization of the learning activities:

The selection of media and tools is broadly discussed in literature. Different scopes are set forward in order to explain *how*, *when* and *what* to choose. One of the most grounded approaches relates to media attributes and affordances (e.g. Conole, 2013). In more general terms, educators choose to integrate (a mix of) technologies, media and tools to deliver and scaffold learning activities. The series of technological applications and systems can be divided in:
- tools for information processing, producing and/or sharing
- communication and interaction tools
- asynchronous / synchronous media
- asymmetrical / symmetrical media
- open/closed system

During the design of BLEs the media and tool selection is determined by:
- the balance between face-to-face and online time
- the character of the learning activity (content, communication, construction),
- the contents (dynamic / static & tactile / aural / visual)
- the role of the instructor (teacher versus learner-centred)
- the magnitude of the group of learners,
- the degree of course flexibility (time/place/resources)

- the attributes or affordances of media and tools (efficiency, user friendly, usefulness, effectiveness)

In 'Choosing the medium in blended learning' (Yelon, 2006) four steps for media selection are defined: (1) thinking about purposes and strategies of training methods, (2) assessing motivation to restructure, (3) checking media compatibility and (4) accounting for resources. Hirumi, Bradford and Rutherford (2011) developed a flow chart in their article entitled 'Selecting Delivery Systems and Media to Facilitate Blended Learning'. Three stages with five questions will guide course designers to select (1) the instructional mode, (2) the system to deliver distance learning contents and the setting for face-to-face instruction, (3) the instructional strategy, media and tools. Picture 1 shows the flow chart that depicts the media selection process explained in detail by Hirumi et al. (pp. 497-498), guided by the following questions:

1. *What is the nature of the educational experience? Do learners need to see graphics, motion video, listen to audio, read text? Would animations and/or simulations facilitate learning? If so, are they worth the time and cost?*
2. *Are f2f interactions planned? If so, when? What other interactions (student-student, student-instructor, student-content, student-community) are planned during the lesson?*
3. *Where are the learners located and how readily can they access the training? Are there soldiers in remote sites that need access? What media and telecommunication are currently available for use?*
4. *What kind of budget do you have? Is there time and resources to acquire additional media and communications tools? Are human resources available to provide technical and pedagogical support to use of planned media and tools?*
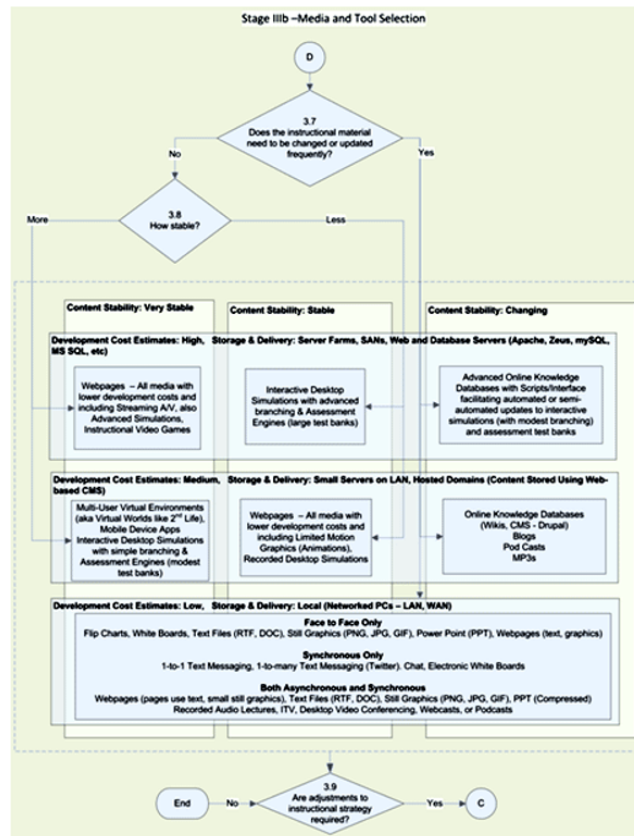
Figure 7 – Flowchart of the media selection process (Source: Hirumi et al., 2011, p. 498)

In 'Blending with a Purpose' (2009) Anthony Picciano proposes a conceptual model for designing BL courses and programs. In this article, the author relates the pedagogical objectives to specific technological applications and argues that 'blending these objectives, activities, and approaches within multiple modalities might be most effective for and appeal to a wide range of students' (p. 14). He distinguishes between six objectives: (1) content, (2) social/emotional, (3) dialectic/questioning, (4) synthesis/evaluation, (5) collaboration/student generated content and (6) reflection. According to Picciano emotional support and social purposes should be provided in a face-to-face mode. Table 4 depicts how the remaining objectives can be supported by suitable digital applications.

Table 4 – Pedagogical objectives and technological applications (adapted from Picciano, 2009)

Objective	Application
Collaboration Student-generated content	Wiki
Content	Content management system Multi-user virtual environments (MUVE) and gaming Media (text, video, audio)
Dialectic Questioning	Discussion board
Reflection	Blog Journal
Synthesis	Paper

Evaluation	Test
	Presentation
	e-Portfolio

3.2.5. Empowering students

For students within BL programs and courses, self-regulation is key to perform and persist academically. Several studies point at the need for supporting learners to become self-directed learners, with team-based and independent learning strategies incorporated in courses (Chang, 2005; De Grez, Valcke and Roozen, 2009). In line with these design recommendations, Bergamin et al. (2010) speak of quality BLEs when: (1) students are provided with feedback and advice to initiate reflections about their learning strategies, (2) educators differentiate their instruction and adapt the LMS in line with learning patterns of students. In Boelens et al. (2017) the reader retrieves four regulative strategies with examples how an educator can facilitate students' learning processes (Table 5):

Table 5 – Regulative strategies (Source: Boelens et al., 2017, p. 4)

Regulative strategies	Description	Example instructional activity
Orienting and planning	Prepare and design the learning process by examining characteristics of the learning task, and determining learning goals, prior knowledge, or time constraints	The instructor introduces the course and activitates learner's prior knowledge.
Monitoring	Observe whether the learning process progresses according to the plan	The instructor administers regular tests to assess students' competencies.
Adjusting	Change the intial learning plan on the basis of the results of the monitoring activity	The instructor gives additional explanations.
Evaluating	Judge the extent to which the final learning outcome is in agreement with the initial plan and the degree to which the learning process has proceeded.	The instructor provides summative tests and example exams.

At university procedures and tools such as an intake questionnaire aid to ascertain learners' entry characteristics upon intake and registration (background, prior learning experiences and performance, expectations). Empowering students can also be achieved by means of orientation, counselling and on-going assistance set-up by a department, a faculty or alike. In MacKinnon-Slaney (1994) we found an example of a

model-driven tool employed for counselling adults in higher education so that they persist.

A kick-off event, planned prior to the start of a formal curriculum, is worthwhile for building up social relationships and aligning expectations. Giesbers et al. (2013) argue that learners need to be prepared in using online learning systems. Such pre-course training should be complemented with orientation (programs), individual (online) study counseling and assistance (Clay et al., 2009). Edirisingha (2009) describes a successful e-mentoring approach to 'bridge the gap between the institutional habitus and a person's habitus'. Possibly, further tools for 'management of expectations' and planning include a planning matrix and/or a study guide (Vandeput, 2011). Next to pedagogical planning, other program arrangements could be made, such as virtual community spaces (Chyung, 2013). The work of Chyung (2001) stressed that providing guidelines for different aspects of instruction (materials, evaluation, interaction) has been proven effective to enhance student persistence.

3.2.6. Building and maintaining communities

There is a consensus that interactivity (instructor-learner, learner-learner, learner-others, materials or resources) presence and learning community building are key to learner engagement in online and blended learning environments (Boelens et al., 2017; McGee & Reis, 2012; Park, Perry, & Edwards, 2011; Song, Singleton, Hill, & Koh, 2004). Using features which promote constructive dialogue and interactive learning activities encourages a deep approach to learning and enhanced understanding of content.

Kember, McNaught, Chong, Lam & Cheng (2010) found using web-based systems for presenting information in a BLE does not seem to effectively help students achieve learning outcomes. Meaningful, student-controlled learning communities (both in person and virtual) are an essential component (Skill & Young, 2002). A higher degree of connectedness between students lead to reduced online withdrawal rates (Rovai & Jordan, 2004).

The first scheduled class is recommended to be face-to-face, in order to establish a sense of community among the students and to help familiarize the students with the LMS or other online tools and apps. Introductory activities further provide learners with the tools to become active participants in the learning community (Kehrwald, 2008). Participation on a regular basis helps learners to get to know each other (Aragon, 2003)
Integrated virtual learning environments (VLEs) enable collaborative strategies: the social connectedness in such 'virtual community spaces' (Chyung, 2013) alters self-directed behavior via cooperation, feedback and support. This is related to a higher satisfaction, an important precursor of persistence (Chyung, Winiecki, & Fenner, 1998; Kim et al., 2014). Several suggestions made by students regarding SRL in Paechter, Maier, and Macher (2010) such as immediate feedback about one's individual learning performance, or compared to results of peers, can be easily implemented program-

wide if delivered via a VLE. These systems allow for automated actions for early warning and reporting, which is beneficial to learners' persistence (Daradoumis, Juan, Lera-López, & Faulin, 2010). Besides, they are now apt to personalization. At the Open University in the Netherlands, for example, an online system was developed with segmented personalization aimed at retaining lifelong learners (Hermans, 2015).

3.2.7. Getting personal

It is important for learners to have the opportunity to choose how they wish to engage according to their own personal situation, learning needs and goals. Too much structure in a course or a program leaves no room for self-directed learning (SRL) and creates dependent learning behavior (Steffens, 2008). BL programs allowing SRL are those built upon flexible, learner-centered trajectories (Sun, Tsai, Finger, Chen, & Yeh, 2008) or organised in modules (Chang, 2005). The more self-directed learners are/become, the less directive a learning programme should be (Grow, 1996). According to Lee and Choi (2011) persistence improves if students determine individually their trajectory and organise their self-paced learning.

Niemiec and Otte (2010), Rovai (2003), Taylor (1995), Toth, Foulger, and Amrein-Beardsley (2008) point out that allowing learners to choose about the what, when and how of learning and assessment, i.e. the sequencing or scheduling depending on their private and professional circumstances, is beneficial to persistence.

Next to these strategies the fourth question in Boelens et al.'s study (2017) - 'how to foster an affective learning climate' - dealt with design issues in BLEs related to motivation, concentration and effort, appraisal and emotions. The authors listed five affective strategies to be used in a BLE:

Table 6 – Affective strategies (Source: Boelens et al., 2017, p. 5)

Affective strategies	Description	Example instructional activity
Motivating	Build and maintain willingness to learn, and form expectations about the course and the outcomes of the learning process	The instructor makes students beliebe in their own capabilities.
Concentrating and exerting effort	Direct attention to task-relevant aspects (instead of distracting, task-irrelevant thoughts), and perform thinking activities that require mental effort.	The instructor builds in variation and pauses, or recommends not to study too long in succession.
Attributing and judging oneself	Attribute learning outcomes to causal factors (e.g. controllable/uncontrollable), and develop	The instructor stimulates realistic attributions.

	judgments about oneself as a learner.	
Appraising	Attach subjective values to learning tasks resulting in willingness to invest energy.	The instructor points out the relevance of a course or task.
Dealing with emotions	Build up and maintain feelings of well-being, self-efficacy, and commitment, and cope with negative emotions (e.g. stress, uncertainty, doubt, helplessness).	The instructor reassures learners and ensures that students experience success.

Additionally, Mozelius and Hettiarachchi (2017) explicated a series of following principles regarding BL designs:

- design with a *human touch*;
- start blended courses with an orientation that informs students on how to use non-trivial online components, or include digital tutorials;
- the online (distance) part of BL should focus on multiple approaches and modalities (*multimodal overloading*) while targeting low complexity and authenticity;
- use a combination of synchronous and asynchronous activities, in a stepwise implementation that avoid trends and hypes;
- connect face-to-face and online components with a meaningful flow from one medium to the next providing the students different paths through the course content and preferably through different media, to better construct their knowledge.

3.3.   Institutional Conditions for Blended Learning Practices

3.3.1. Readiness

Readiness studies, e.g. Keramati, Afshari-Mofrad and Kamrani (2011) or Aydin and Tasci (2005), advocate that particular organizational readiness characteristics such as culture, rules or human resources, impact outcomes in a significant way. Garrison and Vaughan (2013) emphasize the important role of collaborative leadership and its implications for designing BL at a strategic level. In general terms, key to BL success are 'properly resourced, achievable and sustainable' action plans (p. 25). In Gedik, Kiraz and Ozden (2013) two sets of issues were identified: curricular and institutional issues (incl. administration). First mentioned are considered important for developing an educational rationale for the design of the BLE, second refers to support mechanisms which are important for the creation and maintenance of the BLE (logistics, technical and managerial support). Analyses of seven cases of synchronous

BL as described in Bower, Dalgarno, Kennedy and Lee (2015) has led to the Blended Synchronous Learning Design Framework. In this, particular critical issues of technology, support and logistics are included. The critical role of e-learning system infrastructure was scrutinized in Alsabawy, Cater-Steel and Soar (2013). Their study demonstrated that the number and range of IT infrastructure services with regard to channel management, security and integration, along with their maintenance is crucial for success in terms of faculty usage and organizational value. Graham, Woodfield and Harrison (2013), as well as Porter, Graham, Spring and Welch (2014) developed frameworks for institutional BL adoption. Graham's Institutional Blended Learning Adoption Checklist is adapted from these previous contributions. Organizational key aspects include: strategy, structure and support. These are made operational, refined and applied in large-scale comparative research in US institutions.

The studies' outcomes are similar to findings from previous multi-actor e-learning research in a different country, such as Goeman (2008). In this contribution the author referred to five P's as critical success factors for institution-wide implementation of e-learning: problem, planning, policy, participation and promotion.

3.3.2. Mechanisms for CQI

Barrie, Ginns and Prosser (2005) argued 'explicit use of a relevant theoretical base promotes coherence between quality assurance and improvement processes' (p. 641). There are two major CQI mechanisms that bridge theoretical underpinnings and BL practices:
1. design-based research for studying systematically designs and outcomes;
2. learning analytics for online activity measurements of participation, progress, gains and tailored interventions or feedback

In Pombo and Loureiro (2013) the authors report accurately on alterations of a 4-week doctoral blended course. During three consecutive years, the HEI has employed design-based research (DBR) for redesign purposes (Table X). In this manner they collected and studied evidence in order to enhance (the quality of) their peer assessment approach, and to alter the timing of learning activities and the supporting technologies accordingly.

Table 7 – Course alterations on the basis of DBR (Source: Pombo & Loureiro, p. 11)

	2008/09 (Wiki)	2010/11 (social networking)	2011/12 (CMS)
1st week	-Closed individual reflections (googleDocs)	-Open individual reflections (Ning) -Negotiation of the assessment framework (literature review)	-Open individual reflections (Drupal Group) -Negotiation of the assessment framework (literature review+ quality feedback)
2nd week			-Open formative PA+Teachers (paper's structure)
3rd week	-Open formative PA+Teachers (wiki) (1st version)	-Closed formative PA+Teachers (GoogleDocs) (1st version)	-Open formative PA+Teachers (CMS+email) (1st version)
4th week	-Closed sumative self+PA+Teachers assessment (product & competences)	-Closed sumative self+PA+Teachers assessment (product & competences)	-Closed sumative self+PA (competences)+Teachers assessment (product)

With the advent of learning and academic analytics tracking learners' and educators' online activities is facilitated, whether individually, in small groups or as complete program cohorts. Using log file data it is possible to model, measure and visualize activities within a LMS, eventually combined with administrative data (Becker et al., 2017; Lerche & Kiel, 2018; Poon, Kong, Yau, Wong, & Ling, 2017).

The obtained measures can be meaningfully linked to didactics and outcomes at the course, program or institutional level. Data can (aid to) reveal:
- how one or more students progress and perform, in comparison with educator specified goals and/or peer achievement;
- whether and how to improve student engagement or retention
- what student or staff actions contribute to social, cognitive or affective gains.

Consequently, awareness, (self-)reflection and (self-)assessment, all basic components of CQI, are available to students, instructors and/or program coordinators. Furthermore, contemporary dashboards visualize these aspects (see Bodily & Verbert, 2017; Schwendimann et al., 2016).

3.3.3. Drivers and enablers of change

Laurillard (2014) discerns *drivers* and *enablers* of change. First mentioned refers to 'the elements of the HE system that determine how the academic teachers and leaders are likely to prioritise activities' (p. 5). Last mentioned are 'the influences a professional cannot ignore, so they will act to prioritise activities that respond to them' (p. 5). The drivers are not sufficient for effective action without the 'enablers', i.e. the mechanisms the professional cannot do without if they are to respond effectively to the drivers.
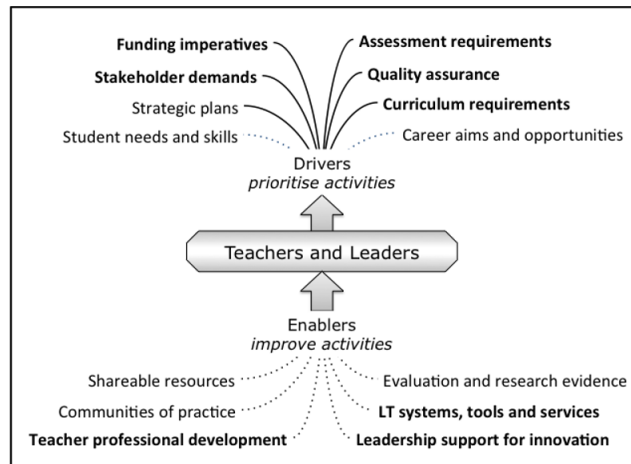
Figure 8 – The interplay between enablers and drivers of change (Source: Laurillard, 2016)

On the basis of her systemic analysis of innovation in HE she recommends the following to promote change (pp. 7-8):

1. require each agency responsible for the drivers to report on how it would change its approach to ensure that academics prioritize innovation in blended learning.
2. update the principal drivers in the education system to harness digital technology and so drive the development of new practices;
3. develop the enablers to make the new practices effective.

The alternative is that the system will continue to rely on piecemeal local innovations in teaching and learning that have no large systemic effect. At institutional level and at national level, education leaders must consider their own responsibility for innovation. Updating educational drivers and enablers to keep pace with the digital world could be sustainable and progressive over the long term, and would make innovation affordable as a natural part of how institutions operate.

4 ASSURING QUALITY OF BL PRACTICES

4.1. QA of BL practices: A multilevel, multidimensional approach.

Successful BL demands a multi-stakeholder approach. Mozelius and Hettiarachchi (2017) recommend to consider four perspectives: (1) the university, (2) the learner, (3) the teacher and (4) the global. Owsten's introduction to the Special Issue 'Blended learning policy and implementation' (2013) put forward two main ideas for working towards a more holistic approach to designing blended learning environments, i.e. 'for blended learning to move to scale institutional goals must align with those of faculty' (p. 2) and 'Introducing blended learning into the academy is not unlike introducing any kind of innovation into existing organizations.' (p. 3). Drawing upon complexity theory, Russell (2009) identified contextual influences on individual strategies. More in particular, she explored the interplay and formal roles of faculty and learners, materials and support services which impact the uptake of novel technology-enhanced instructional approaches. Further, in this regard, Garrison and Vaughan (2013) stated that 'transformational institutional change related to blended teaching and learning approaches is predicated upon committed collaborative leadership that engages all levels of the institution' (…) leader collaboratively create strategic direction and have the courage and commitment to implement and sustain specific action plans' (p. 28).

We deem BL practices are conditioned by institutional strategies, (experienced) support, continuous professional development and other aspects of the university context, among others its quality assurance culture. Institutional strategies are conditioned by governmental policies - resources and views are impacted. For the purpose of this project we distinguish between three levels (Dillemans et al., 1998; Goeman, 1998):

- the micro level 'refers to the core of the educational system, where both learning processes and instructional processes are situated' with learners and 'instructional agents' actors who take part in or support actual BL;
- the meso level with actors who determine the (inter)institutional BL strategy, support and CQI;
- the macro level referring to a broader societal context where different actors are involved to set up regional, national and/or international policy frameworks.

4.2. QA Frameworks

In the past decade various quality assurance frameworks, instruments for evaluation and standards for technology-enhanced learning or ICT-supported education have emerged. More recently, QA publications concerning BL or related topics appeared. These can be applied to monitor systematically (certain aspects of) blended learning practices and conditions, and provide stakeholders with (continuous) feedback to guide blended transitions. After each cycle of quality monitoring, the approach towards BL can be remained, adjusted or altered significantly, both on the institutional, program and course level. By means of such frameworks one can benchmark HEIs, compare experiences and, eventually, contribute to accountability requirements. During this literature review, we noticed that, very recently, the European Foundation for Quality in Blended Learning was established.

In the following, we present some of the best known quality frameworks in online and blended learning (OBL). Some are developed to be applied at the national or regional level, some are integrated frameworks to assure quality of OBL.

4.2.1 Statutory Quality Assurance Guidelines

In 2018, the 'Statutory Quality Assurance Guidelines for Providers of Blended Learning Programmes' were published. The report is created within the Irish context and is an appropriate but rare illustration of an explicit blended QA approach on the national level. The guidelines relate to the organizational context, the blended programme development and assessment, and the learner experience of Irish providers of BL programmes and related services (in particular Irish universities).

Within the organisational context, a good practice implies a strategy and plan, and "an appropriate investment of time, money and other resources to develop capacity and resources to deliver high quality blended learning that will offer learners a consistent, enjoyable and effective learning experience." (p. 8)
Procedures need to be in place to ensure that a strategic approach is "explicit", "widely understood" and … "shared with staff, learners and other stakeholders", and to ensure that "accountable key roles" are provided. The guidelines emphasize the need for particular processes, policies and/or regulations that are "fit-for-purpose", dealing with issues such as the recruitment and admission policies, arrangement for the board of examinators, the training of teaching and support staff, etc.

Obviously, quality assurance also explicitly demands the management of the infrastructure and resources required to support BL. Such resources "are understood, planned, and routinely monitored and evaluated." Learning materials and delivery mechanisms are appropriate, and also reviewed and monitored. Blended programmes as a whole need to be appoved and validated. Provision should be made for learners outside of Ireland and for potential collaboration with external partners (for instance providing the online content).

Finally, in line with the literature and our definition of BL, procedures "supporting the development and delivery of a blended programme … will need to ensure that the value of online learning in enabling learners to meet intended learning outcomes".

Finally, also the learner is considered to be an essential part of good blended practices. Learners need to be well informed and supported (on a technological and pedagogical level). Some issues mentioned relate to: the need to have sufficient contact points, including formal feedback, and the provision of information about the life-span of online sections, the way personal data will be treated and the way the learners will be evaluated.

The QA guidelines are statutory, established by Quality and Qualifications Ireland (QQI) meaning that BL providers of BL programmes and related services need "to have regard to QQI's quality assurance guidelines when establishing their own QA procedures." (p. 3)

4.2.2 The E-Vangelist's Plan of Action (2009)

In Chew and Jones' 'E-Vangelist's Plan of Action' (2009) two UK HEIs with exemplar experience in the institutional adoption of BL have been scrutinized in-depth, using a comparative case study method. The research adds to the number of national studies on HEI BL policies and strategies.

The findings of the studies can be summarized as follows.
- 1 BL strategy in a HEI is necessary "to prevent confusion for academics and students" (p.387)
- An institutional strategy and policy should be a simple and understandable, yet flexible approach "for **for institutional-wide adoption underpinned by research** support from a inter-disciplinary centre;
- (3) There is not 1 unique generic approach for a blended learning strategy. Interdisciplinary and individual interests and initiatives are required.
- To promote institution-wide BL adoption, top management involvement is good practice. Top managers within the HEI should recognize and support excellence in (BL) teaching and BL research.

4.2.3. Benchmarks for Technology-Enhanced Learning

In 'Benchmarks for Technology Enhanced Learning' (ACODE, 2014) the Australasian Council on Open, Distance and e-learning (ACODE) developed benchmarks to monitor the 'capacity to provide the best possible technology enhanced learning experience for their students and staff'. The goal has been the sustainable improvement of quality in e-learning (Goodacre, Bridgland, & Blanchard, 2005).

The ACODE approach takes an institutional position: 'integrating the key issue of pedagogy with institutional dimensions, such as planning, staff development and

infrastructure provision.' (Sankey, Carter, Marshall, Obexer, Russell & Lawson, 2014, p. 4). The benchmarks are developed for self- assessment, or as part of a broader benchmarking activity between HEIs. The framework comprises 8 benchmarks which can be used as standalone indicators or as an integrate whole to reflect the institutional perspective.

It covers the following eight topic areas:
1. Institution-wide policy and governance for technology enhanced learning;
2. Planning for institution-wide quality improvement of technology enhanced learning;
3. Information technology systems, services and support for technology enhanced learning;
4. The application of technology enhanced learning services;
5. Staff professional development for the effective use of technology enhanced learning;
6. Staff support for the use of technology enhanced learning;
7. Student training for the effective use of technology enhanced learning;
8. Student support for the use of technology enhanced learning.

Each of the 8 benchmarks includes a Scoping Statement, a Good Practice Statement, a set of Performance Indicators (PIs), based on a 5-point scale, and an area to make initial recommendations on issues that emerged from the assessment and that may need improvement. In 2015, 24 institutions from 5 countries participated in a validation exercise and applied some or all of the benchmarks and confidentially shared their results with the other participants. Data was collected through the benchmarking instruments used by HEIs, notes from the discussions by participants at a three-day summit where participants met, and two surveys. On the basis of this validation several recommendations were made (Shankey & Padro, 2016).

4.2.4 E-Learning Maturity Model

The very well-known e-learning Maturity Model (eMM) is 'a quality improvement framework designed to support educational institutions interested in improving their organizational capability to use technology in learning and teaching in a complex and changing environment. ' (Marshall, 2013, p. 547) The eMM originates from the Capability Maturity Model (CMM) and Software Process Improvement and Capability Determination (SPICE) methodologies (Marshall & Mitchell, 2002; Kohlegger et al, 2009). One of the objectives of the eMM project is 'to place quality activities within an explicit theoretical and practical model of organizational change, moving beyond the good advice and specific recommendations that characterize the majority of published work in this field' (Marshall, 2012). It provides a set of 35 processes, divided into 5 process areas, that express a key aspect of the capability of an HEI to accomplish a successful e-learning transition:
(1) learning, (2) development, (3) support, (4) evaluation and (5) organization.

The e-MM further consists of 5 dimensions; *delivery*, *planning*, *definition*, *management* and *optimization.* Each dimension is broken down further into practices. The dimensions describe the capability of practices from a lower (delivery) dimension to higher (optimisation) dimension. Rather than measuring progressive levels, the e-MM assesses the capability of a process from the perspective of these 5 dimensions. A HEI that has capability on all dimensions for all processes is considered to be very capable of providing e-learning practices. An institution that has developed capability at higher dimensions but lacks capability at the lower dimensions will not deliver the desired outcomes (Marshall & Mitchell, 2007).

Applying the eMM assessment in a HEI can results in detailed information on the institution's e-learning capability and may identify good practices and opportunities for improvement. The intention is to 'highlight the role that the eMM, and similar tools including the ACODE benchmarks (ACODE, 2008 (..) can play in improvement as opposed to the normal rhetoric of quality as a tool for coercion and ranking' (Marshall, 2013, p. 553). Marshall applied the model to a number of universities from New Zealand and Australia, resulting in the overview presented in figure 9.
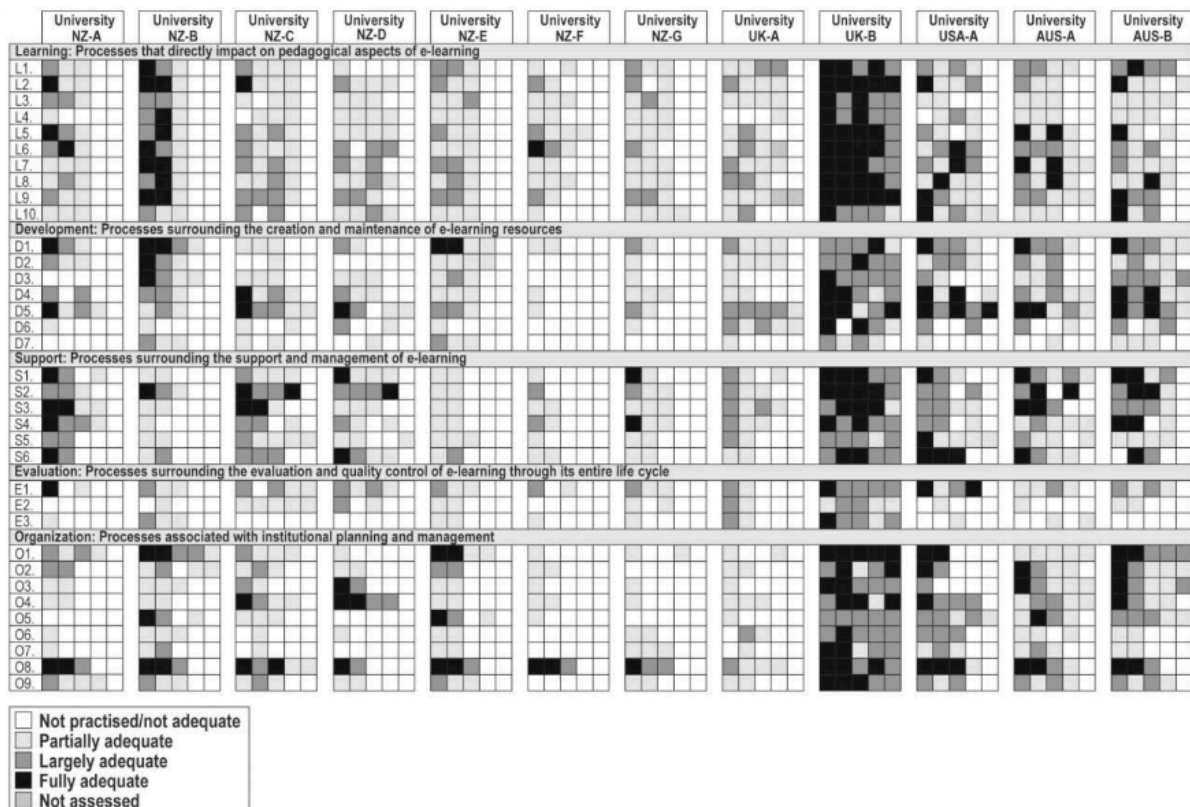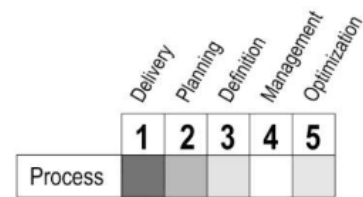

Figure 9 – Application of the eMM (Source: Marshall, 2013)

More extensive details of the application of the eMM is available in the literature (Marshall, 2009, 2010, 2012a, 2013). Some general finding, pertinent in almost all scrutinized universities, include a weak management dimension and evaluation process. 'This reflects the somewhat surprising lack of systems analyzing the impact of technology on student learning and staff teaching activities. This lack is surprising as there is a strong focus on performance reporting and management systems apparent in the Australian institutions but these are not directed at improving the outcomes measured by the e-MM.' (Marshall, 2013, p. 550) Another common weakness relates to the process 'E-learning resources are designed and managed to maximize reuse' where most universities were found to have minimal commitment to reuse. Other limitations that were exposed by the e-MM include the lack of pedagogical support of students and 'the lack of information for students helping them prepare for the use of technology in their studies'. (Marshall, 2013, p. 550). Despite this evidence on the eMM, Marshall underlines that 'it is unclear to what extent the issues identified here are systematically a problem, although the parallels to assessments of international institutions suggest that they may well be. The eMM project is ongoing and the intention is to expand the sample of Australian universities as much as funding and willingness to participate allows.' (Marshall, 2013, p. 553).

4.2.5 E-xcellence

The E-xcellence quality benchmarking instrument was developed by the chair of the underlying Erasmus+ project, the European Association of Distance Teaching Universities (EADTU). Aim is to support HEIs 'enhancing their Online, Open and Flexible (OOF) education at program, faculty and institutional level' (cf. https://e-xcellencelabel.eadtu.eu/). Its offers a supplement on e-learning specific issues to existing, local QA systems, without interfering with ordinary quality assurance systems in higher education (Ubachs, 2009).

The E-xcellence consortium consisted of expert representatives from open and traditional universities and assessment and accreditation bodies for higher and adult education (Ossiannilsson, 2012). The E-xcellence associates are focusing on the improvement of four elements of progressive higher education: Accessibility, Flexibility, Interactiveness and Personalization. 33 benchmarks are grouped into three areas covering six fields: strategic management, products (curriculum design, course design, course delivery) and finally, services (staff and student support) (Ossiannilsson, 2012). The benchmarking can be accomplished both online, by a guided self-assessment, a so-called a 'QuickScan', and with a Full Assessment with evidence, or both. The QuickScan is a simplified version of the Full Assessment tool. It is supplemented by a full online manual, available on a web portal (cf. https://e-xcellencelabel.eadtu.eu/tools/quickscan), resulting in insights for improvement. This approach can be extended with a review from e-learning experts, possibly on-site. This extension or full assessment can then be formalized with an E-xcellence Associates label.

The E-xcellence framework was empirically validated using a mixed-method approach in 5 cases, i.e. universities. Altogether approximately 175 participants (vice-rectors, management, professors and students) took part in the valorization phase of E-xcellence. The data were collected mainly through reports from a seminar, but also using questionnaires and interviews following the case study protocol. The cases were scrutinized using the QuickScan, accompanied by meetings and discussions. 1 institution was fully assessed. Internal outcomes revealed that within the universities individuals' conducting the QuickScan remained to the same conceptual framework which led to trust, transparency, and internal and extended dialogues. External outcomes were described as visibility for stakeholders, students, agencies and the public. Although findings indicated that the E-xcellence framework requires fine-tuning and that its application should be contextualized, it was concluded that benchmarking is a powerful tool to support improved governance and management in higher education, in alignment with national and international quality agencies. In short, the E-xcellence framework was found to be apt for quality improvements in teaching and learning.

4.2.6 Institutional development

Harnessed by the adoption literature and buttressed by empirical evidence i.e. multiple case studies, Graham, Porter and different co-authors (2013, 2014, 2016) developed a QA framework for BL adoption and diffusion in HEIs. The framework incorporates a pattern of progress across three general stages of development that can help university administrators with the strategic adoption and implementation of BL in their HEI. Their model identifies institutional strategy, structure and support markers that allow administrators to determine a successful transition from the awareness phase (stage 1) to a mature implementation (stage 3). Porter & Graham's institutional recommendations are summarized in table 8.

Table 8– BL Implementation Recommendations (Porter & Graham, 2014, p.192)

Summary of institutional BL implementation recommendations organized by BL adoption framework categories.

Theme		Recommendation
Strategy	Purpose	Institutions should align their purposes for adopting blended learning with both institutional and faculty goals and values.
	Advocacy	Institutions should identify and develop advocates at multiple institutional levels, including school and department administrations, faculty resource centers, faculty members, and students.
	Definition	Institutions should publish a uniform definition of BL that designates BL's structural dimensions such as the integration of face-to-face and online instruction. Faculty should retain the flexibility to make pedagogical decisions regarding their BL course redesign.
Structure	Infrastructure	Institutions should prepare to scale initial BL adoption efforts by upgrading their servers, bandwidth, and other infrastructure.
	Scheduling	Institutions should clearly designate their BL offerings in their course catalogs in a way that accurately reflects any consistent reductions in seat time.
	Governance	BL governance should involve institutional and department administrators as well as faculty input.
	Evaluation	Institutions should establish evaluations based on common course evaluations, assessments, and outcomes in traditional and BL classes.
	Professional development	Institutions should consider a number of variables when selecting their professional development delivery methods, including potential training providers, the quantity of adopters that require training, and participants' needs.
Support	Support	Institutions should determine both faculty and student BL adopters' support needs and satisfy them.
	Incentives	Institutions should consider providing incentives to BL adopters such as financial compensation, additional time for adoption, or taking BL adoption into consideration during tenure and promotion.

Graham's model has been empirically validated on three occasions. To propose and develop the framework, 6 case studies (HEIS) were scrutinized in a prior study (Graham, Woodfield & Harrison, 2013). Next, the model was applied to sample of 11 higher educational institutions (Porter, Graham, Spring & Welch, 2014). In 2016,

Porter & Graham applied the framework in combination with Roger's diffusion of innovation theory in a university to determine 'the degree to which institutional strategy, structure and support decisions facilitate or impede BL adoption among higher education faculty.' (p. 748). General key findings include the need 'to develop BL advocates at multiple institutional levels in order to establish a shared implementation vision, obtain necessary resources, and attract potential adopters. ' (Porter & Graham, 2014,p. 194) Moreover, HEIs need to define a proper BL structure, including infrastructure, scheduling of courses, governance, evaluation and professional training of lecturers, for potential adopters 'while allowing them the freedom to make pedagogical decisions.'

4.2.7 Quality scorecard for BL programs

The quality scorecard for blended learning programs is developed by the Online Learning Consortium (OLC), a nonprofit organization that provides sources and services in online learning to learning professionals and organizations. It is based on the research by Kate Shelton. The scorecard is documented by Jennifer Mathes and Karen Pedersen, both directors at the OLC (Mathes & Pedersen, 2016).

According to the OLC the quality scorecard for blended learning programs is 'an easy to use process for measuring and quantifying elements of quality within blended learning programs in higher education.' (Mathes & Pedersen, 2016). The aim of the quality scorecard is to give blended learning program administrators a tool to assess the quality of their blended learning practices in such a way that the quality can be demonstrated to external parties.

The tool is comprised of a scorecard and an accompanying handbook which serves also as a catalogue of best practices. The tool consists of eight categories: Institutional support, technology support, course development and instructional design, course structure, teaching and learning, faculty support, student support, evaluation and assessment. Each category is monitored by different indicators (70 in total). These indicators are derived from the research literature on blended learning of which references are included in the handbook.

Each indicator is scored by the institution's administrator on a scale (from 0=deficient to 3=exemplary). Afterwards a total score per category is calculated:
Institutional support (27 points), technology support (21 points), course development and instructional design (42 points), course structure (24 points), teaching and learning (15 points), faculty support (18 points), student support (33 points), evaluation and assessment (30 points). This leads up to a total score that can be interpreted as follows:
- Exemplary: 90-100 % (189-210 points)
- Acceptable: 80-90 % (168-210 points)
- Marginal: 70-70 % (147-167 points)
- Inadequate: 60-69 % (126-146 points)

- Unacceptable: < 59 % (<125 points)

These scores are an indication for the quality of the blended learning program. It is clear that the tool focusses on demonstrating 'quality'. However, the points are not related to a certain stage or level in BL adoption. It would therefore be interesting to investigate these indicators in the context of the framework by Graham et al., 2013).

Overall the OLC tool is well documented and is comprised of a comprehensible set of indicators. Furthermore, it offers recommendations for each indicator that provide b-learning administrators with advice on what can be done to improve the score on the indicator. However, it is not clear how the tool was validated. Only a brief methodological description is provided, referring to the use of the Delphi research method whereby 54 experienced blended program administrators were involved as an expert panel. This panel was conducted to compose the quality score card. But, as mentioned, it is not clear whether or how the tool was tested, once compiled.

4.2.8 Proven practices and critical success factors

On the course level, multiple studies have been published including proven blended practices and critical success factors. Although a considerable part of the studies are fairly anecdotal, their outcomes have helped to identify key issues related to the quality of blended courses, such as: the presentation of course material (both in-class and online), lecturers' pedagogical knowledge, the training, support and workload of lecturers, the use of the available (LMS) technology to its full potential (in and outside the classroom), the provision of continuous online assessment features for students, course access and flexibility, student and teacher interactions, and student satisfaction.

For example, Helms (2014) explored literature on blended (and hybrid) learning with the goal to identify recommendations for instructional designers. The author confirms the advantages of BL, including improved grades, retention and communication and offer more detailed guidelines regarding: face-to-face scheduling (e.g. planning a face-to-face meeting in the beginning, the middle and end of a course), communication (e.g. integrating online and classroom discussions), course content (e.g. course information document are best presented online) and student motivation (e.g. lack of online responses and repeating contents in both online and face-to-face sessions have a negative impact). The author regards their endeavor as a first step in research that needs to establish best practices for instructional design.

In 'Blended Course Design: a Synthesis of Best Practices', McGee and Reis (2012) provide insight into the characteristics of quality blended courses, based on 67 'best' or 'effective' learning practices in order to determine 'commonalities across expressed practices and (…) pedagogical patterns as related to instructional design theory and strategies' (p. 10). Besides providing examples and references to varying approaches in designing a blended course, the authors conclude with 5 areas that require consideration when conceiving BL: (1) variations in design and approaches, (2)

alignment of course components, (3) moderation of interactivity and expectations, (4) intentional classroom technology and (5) support of course re-design.

The process of BL design should be one of re-design, meaning that the lecturers or designers should be willing to see beyond the traditional approach and 're-conceptualize what can be done in multiple delivery modes'. While active learning is emphasized, proper and aligned assessment is promoted, in order to stimulate participation, ownership and motivation. Continuous interaction is not really addressed, but also not desired in BL environments. As a matter of fact, miscommunicating requirements and inflated human interaction may result in lower levels of achievement. According to the authors, the BL literature tends to overemphasize the use of technology outside the classroom, while limited attention to the potential of classroom technology decreases the value of technology-enhanced learning.

A quantitative meta-analysis on the effectiveness of (certain types of) BL and TEL was conducted by Schmid, Bernard, Borokhovski, et al. (2014). Their analysis incorporates more than 870 studies in higher education, and aimed at scrutinizing the impact of higher degrees of instructional technologies on students' achievements (learning outcomes) and attitudes. The overall conclusion is that learning is best supported when the student is engaged in meaningful exercises via technological applications that provide cognitive support. Such applications 'encompasses various technologies that enable, facilitate, and support learning by providing cognitive tools (e.g., concept maps, simulations, wikis, different forms of elaborate feedback, spreadsheets, word processing).' However, despite their meticulous research method and extensive sample, the authors convey that 'we are a long way from understanding more specifically how to design effective cognitive support tools and when precisely and how to integrate them into instruction.'

Some studies report about courses conceived and developed on the basis of CQI approaches. The Good Research Practice Program (Cho & Shin, 2013) was developed using the ADDIE-model which entails 5 stages: analysis, design, development, implementation, and evaluation. Although completely focused on the development of an online Master's program, the article 'Using Continuous Improvement in Online Program Design' (Carnovale, Allen, Pullman & Wong, 2016) presents a very valuable systematic approach to ensure integral continuous (quality) improvement of programs and courses. By using the Design-Measure-Analyze-Improve (DMAIC) strategy their institution is committed to use an assessment technique that is 'able to integrate and handle multiple complex CI/measurement projects simultaneously. The authors state (p. 128):

> (…) what is vital is a thorough understanding of the pedagogical best practices associated with the design and assessment of academic programs. (…) what is paramount is linking design elements to student learning outcomes through appropriate applications of program-level assessments. Connecting the design elements of online educational programs to appropriate student outcomes requires an institutional commitment to assessment as well as a framework to measure student

performance objectively against the program's learning goals and objectives.

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DELIVERABLE 2 – RESEARCH INSTRUMENTS

1 INTERVIEW OBJECTIVES BL PRACTICES @ HIGHER EDUCATION INSTITUTION

The main objectives of the interviews related to the questions are listed in the table below:

Objectives	Questions
To gauge the interviewee's BL previous and current experience(s)	1
To map the interviewee's BL specific approach, applied to one or more example course(s) including addition(s) to the online survey responses • learning activities • proportion and sequencing off/on • adaptability/personalization/flexibility • (online) social presence/learning community building	6, 8, 9, 10
To get insight into personal or external motives for adopting a BL approach and possible other influencing factors	2
To scrutinize willingness for reusing and/or sharing BL materials	3 & 4
To identify how/whether the university supports adequately BL initiatives (proactive/enabling role, QA, incentives...)	5
To assess perceived added value of BL (as opposed to a pure online approach)	7
To gauge the student perspective, including feedback loop, ideas and plans for the future related to BL (design)	11 & 12
To describe important issues regarding design of BL courses	13

2 INTERVIEW PROTOCOL BL PRACTICES @ HIGHER EDUCATION INSTITUTION

This protocol guides each of the interviews with course designers or instructors at the different partner universities in the consortium.

Note: prompts are to guide or follow up on discussions of the main questions. They may or may not be used (selectively or completely) depending on the way the conversation unfolds.

Interview data

	Interviewer:
Date:	Interviewee (name, job title):
Start Time:	University - Faculty - Program - Educational level:
Meeting Location:	
	Course name:
Elapsed Time:	

Introduction

Good morning/afternoon/evening, many thanks for agreeing to participate in this interview. We are {NAME INTERVIEWERS}. The purpose of this interview is to gain detailed insights about your course {NAME OF THE COURSE} in program {NAME OF THE PROGRAM} at your faculty {NAME OF THE FACULTY}. In particular, we are interested to know how and why you have implemented blended learning. Both of us are involved in EMBED, a European project which aims to monitor blended learning practices, programs and policies in different member states.

I am {NAME OF INTERVIEWER 1}. I work as a {JOB TITLE} at {NAME OF THE UNIVERSITY}. I will lead the interview, my colleague {NAME OF INTERVIEWER 2} will take notes. The interview should take no longer than an hour of your time. Please would you sign the informed consent form signaling your willingness to participate?

SIGN INFORMED CONSENT FORM

During the interview, you will be asked to respond to several open-ended questions. You may choose not to answer any of these questions. The procedure will involve recording the interview and will be transcribed verbatim. If you do not wish to be recorded, please tell us at any given moment. Everything you say is treated confidential and anonymous. Would you like to see the transcript or the report in case you would like to make additions?

TEST RECORDING EQUIPMENT

At this point we would like to know if you have any questions or remarks.
We are ready to start the interview.

In our view, blended learning encompasses 'the deliberate, integrated combination of online and offline learning activities.' In the following interview, we would like you to think alike about BL. In this way, we avoid problems interpreting your view or experiences with BL.

Main questions	Prompts (may or may not be used)
1. **Can you describe your BL experiences up until today?**	• When did you first combine deliberately online and offline learning activities? • Do you employ BL for each course you teach? • Looking back, how would you assess your BL experiences? Why? Can you illustrate your answer by giving one or more examples? • Would you like to add any other information with regard to your BL experience(s)?
2. **Why did you start with blended learning?**	• Why did you adopt a BL approach for your courses? • Are there specific objectives you expected to achieve (better) with a BL approach? • Are there specific regulations at your university/ faculty/ department or other

	that influence the way you organise your BL course(s)? • Were there any external drivers for adopting a BL approach? • Were there any external constraints? How and why did these influence the way you adopted BL approach? • Have you encountered any negative our unexpected outcomes of BL?
3. **Do you share your BL experiences or resources with colleagues?** 4. **Are your BL activities or resources available through open educational resources (OER)?**	

5. **Is there support available for you to adopt BL in your course/ programme?**	• Could you describe its main aspects?
	   o technological support, including infrastructure for BL?
	   o pedagogical support?
	   o professional development? in what areas?
	• Are you satisfied with this support? Is it adequate? Why (not)?
	• Do you or your colleagues get an incentive from the department/ university for implementing BL?
	   o in terms of course load reduction?
	   o or funding
	   o or availability of tools
	   o or promotion?
	• Does your institution have a strategy or vision about BL implementation that you know of?

SHOW THE SURVEY ANSWERS WITH REGARD TO THE SELECTED BL COURSE	
6. **Let's have a look at the survey data about your BL course "X" (mention the correct course name). Could you describe in more detail...**	• Could you please complete the missing data in the questionnaire? • The flow of the online and offline learning activities: could you describe the sequence of these learning activities?

	• Anything else you would like to add with regard to your particular BL approach for this course?
7. **According to you, could this course be offered completely online? What is the added value of the <u>offline</u> activities for this course?**	
8. **To what extent do students have the flexibility of personalising these learning activities?**	• Regarding the course content? • With regard to the course's pace or sequencing of the learning activities? • The location where they follow the course? • Do students use this opportunity? How? • How did you try to accommodate the needs of individual students in the curriculum design with the BL approach?
9. **In what way(s) do you ensure your online presence? Do you create learning communities? How? Or why not?** 10. **How important is it for you to be present online or offline?**	

11. **What are students' reactions to your BL course?**	• How do you or your department/university assess student satisfaction/engagement/perceptions concerning your BL course?
	    o course statistics
	    o survey or interview
	    o learning analytics
	    o other means?
	• Did you notice any resistance among students?
	• Did you get any important suggestions of students to improve your BL course? Can you elaborate?

We have arrived at the end of this interview. In this last part, we would like to touch upon some reflections regarding BL.	
12. Do you plan to adapt or change this BL course in the near future?	• What activities, tools or resources would you like to implement in the future? For what reason(s)?
13. Would you have any advice for people who are thinking about designing BL courses?	

CLOSING QUESTIONS

These are all the questions from my side. Is there anything else you would like to tell me before we end this interview?

We arrived at the end of this interview. As said earlier, I can provide you with the interview's transcript for your approval. Or if you would like to receive the report I can send it to your address.

I thank you kindly for your time and consideration, and I wish you a pleasant day.

3. DESK RESEARCH & INTERVIEW CONDITIONS @ HIGHER EDUCATION INSTITUTION

Documentation

Policy framework

Please, collect public (governmental) documents or web links that provide information about the current policy framework at the country or regional level:
- which explain or illustrate decision making procedures regarding higher education and accreditation of higher education institutions
- which express key ideas and concepts with regard to technology-enhanced learning (TEL), online and/or blended learning (OBL)
- which elaborate if funding is provided for exchange programs or networks (intra-institutional, inter-institutional in 1 country or region, international) regarding TEL or OBL

Institutional strategies

Please, collect documents on current strategies and future plans regarding blended learning at the university which express:
- a vision on education and educational innovation at the university;
- the approach(es) of implementing technology-enhanced learning (TEL), online and/or blended learning (OBL) at the course/program/institutional level
- the quality assurance procedure(s) of TEL and/or OBL

Please, fill out the following key information about the higher education institution:

Founded	
Nature of the university (research/teaching-led)	
Number of academic staff	
Number of students	
Key ideas and concepts regarding education (spearheads)	
Specific approach/view on blended learning	

Persons to be interviewed on site:
One or more persons should be appointed to prepare and organize interviews. It is important to include interviewees who are knowledgeable about the strategies, resources and practices at the higher education institution. It is important that each interview gives access to key documentation regarding university education and TEL and/or OBL in particular.

Potential interviewees include:
- Vice Rector Education
- Senior administrators: programme directors, deans, vice deans
- Staff at research and development services for teaching and learning/innovation of education/blended learning/... or related
- Staff at support services for teaching and learning/innovation of education/blended learning/... or related

Prior to each interview the complete interview protocol is sent to each of the interviewees. Each interview will last between 1 and 1,5 hours.

4. INTERVIEW OBJECTIVES BL CONDITIONS @ HIGHER EDUCATION INSTITUTION

The main objectives of the interviews related to the questions are listed in the table below:

Objectives	Questions
To identify local, regional and/or national policies regarding BL or TEL	1
To map regional and/or national funding opportunities for BL or TEL in HEIs	2
To scrutinize strategies for (O)BL, educational innovation or TEL, and their promotion	5, 6, 7 & 8
To describe the introduction and transition (experiences) of BL	3 & 4
To describe the introduction of BL	1
To scrutinize implementation objectives and local uptake of BL programs and courses	2 & 3
To map professional development and staff support	4
To scrutinize resources and approaches to promote BL practices	5
To scrutinize the QA regarding BL or TEL	6
To map how student needs are addressed in the design and delivery of BL programs and courses	7
To identify challenges related to BL adoption and diffusion	
To identify changes in the institution's readiness for BL	

Interview protocol - Institutional conditions for blended learning – (VICE)RECTOR

This protocol guides each of the interviews with policy makers, key persons or major influencers at the different partner universities in the consortium.

Note: Prompts are to guide or follow up on discussions of the main questions. They may or may not be used (selectively or completely) depending on the way the conversation unfolds.

Interview data

Date: Interviewer:
Start Time: Interviewee (name, job title):
Meeting Location: University - Department or service:

Elapsed Time:

Introduction

Good morning/afternoon/evening, many thanks for agreeing to participate in this interview. We are {NAME INTERVIEWERS}. The purpose of this interview is to gain detailed insights about institutional conditions for blended learning at your university {NAME OF THE UNIVERSITY}. In particular, we are interested to know what kind of strategies, as well as implementation and change conditions are in place. I am involved in EMBED, a European project which aims to build a maturity model for blended learning.

I am {NAME OF INTERVIEWER 1}. I work as a {JOB TITLE} at {NAME OF THE UNIVERSITY}. I will lead the interview, my colleague {NAME OF INTERVIEWER 2} will take notes. The interview should take no longer than an hour and a half of your time. Please would you sign the informed consent form signaling your willingness to participate?

SIGN INFORMED CONSENT FORM

During the interview, you will be asked to respond to several open-ended questions. You may choose not to answer any of these questions. The procedure will involve recording the interview and will be transcribed verbatim. If you do not wish to be recorded, please tell us at any given moment. Everything you say is treated confidential and anonymous. Would you like to see the transcript or the report in case you would like to make additions?

TEST RECORDING EQUIPMENT

At this point we would like to know if you have any questions or remarks.
We are ready to start the interview.

CORE QUESTIONS

In our view, blended education is 'the formal context of blended learning (practices) that is determined by policies and conditions with regard to the organization and support of blended learning'. Blended learning encompasses 'the deliberate, integrated combination of online and offline learning activities.

In the following interview, we would like you to think alike about BE and BL. In this way, we avoid problems interpreting your view or experiences.

Main questions	Prompts (may or may not be used)
1. **In [your country], is there a national and/or regional (public) policy for higher education that specifically addresses blended learning (BL) or technology-enhanced learning (TEL)?**	• Is/was your institution involved in the national and/or regional (public) policy making process?
2. **Do you know of any national/regional funding opportunities for universities that support blended-learning (BL) or technology-enhanced learning (TEL) education?**	
3. **So far, what has been your university's experiences regarding BL?**	

4. **When and how was blended learning introduced at your university?**	• By whom?
	• Why?
	• What are the goals?
	   ○ International visibility and reputation of the university?
	   ○ Innovative learning and teaching?
	   ○ Student recruitment and preselection?
	   ○ Cooperation with other higher education institutions, partners or companies?
	• Was BL introduced based on strategic decisions?
	• Did the university use an incremental change approach, or was it rather a radical shift?

Main questions	Prompts (may or may not be used)

5.	**Does your institution have a dedicated strategy regarding blended learning (or online learning, educational innovation, and technology-enhanced learning)?**	• How was it developed? • Who was involved in this process? What was their role or contribution? • What are the current and future strategic priorities of your university concerning BL?
6.	**How does your university promote BL practices?**	• Are emergent practices shared internally or externally? • How does the university ensure that BL practices are sustainable? • Does the institution have a course development model for blended learning courses? • How does/did the university ensure a shared vision on the BL strategy throughout the faculties or departments?
7.	**Who are the main stakeholders at your university for deciding upon the design and implementation of BL?**	• What is their role/contribution? • Who is driving/promoting changes in teaching and learning at your university? • Is there a well-known recognized leader for leading changes in technology and learning at your university? • According to your experience at your University, what would motivate instructors or programme directors to adopt BL (conditions with regard to strategy, change or implementation)? • Are teaching staff recognized for their efforts to design or deliver BL courses (e.g., financial incentives, teaching load reduction, promotion, additional staff or equipment, etc.)?
8.	**Is there a local policy for BL?**	• How was it developed? • Did staff or students participate in the development process?

CLOSING QUESTIONS

- What would you recommend to leaders who want to implement a BL approach at their institution?
- Are there any additional institutional issues related to BL that you think that are relevant to our conversation? If so, please share.

Interview protocol - Institutional conditions for blended learning – STAFF at R&D SERVICE FOR TEACHING AND LEARNING

This protocol guides each of the interviews with policy makers, key persons or major influencers at the different partner universities in the consortium.

Note: Prompts are to guide or follow up on discussions of the main questions. They may or may not be used (selectively or completely) depending on the way the conversation unfolds.

Interview data

Date: Interviewer:
Start Time: Interviewee (name, job title):
Meeting Location: University - Department or service:

Elapsed Time:

Introduction

Good morning/afternoon/evening, many thanks for agreeing to participate in this interview. We are {NAME INTERVIEWERS}. The purpose of this interview is to gain detailed insights about institutional conditions for blended learning at your university {NAME OF THE UNIVERSITY}. In particular, we are interested to know what kind of strategies, as well as implementation and change conditions are in place. I am involved in EMBED, a European project which aims to build a maturity model for blended learning.

I am {NAME OF INTERVIEWER 1}. I work as a {JOB TITLE} at {NAME OF THE UNIVERSITY}. I will lead the interview, my colleague {NAME OF INTERVIEWER 2} will take notes. The interview should take no longer than an hour and a half of your time. Please would you sign the informed consent form signaling your willingness to participate?

SIGN INFORMED CONSENT FORM

During the interview, you will be asked to respond to several open-ended questions. You may choose not to answer any of these questions. The procedure will involve recording the interview and will be transcribed verbatim. If you do not wish to be recorded, please tell us at any given moment. Everything you say is treated confidential and anonymous. Would you like to see the transcript or the report in case you would like to make additions?

TEST RECORDING EQUIPMENT
At this point we would like to know if you have any questions or remarks.
We are ready to start the interview.

CORE QUESTIONS

In our view, blended education is 'the formal context of blended learning (practices) that is determined by policies and conditions with regard to the organization and support of blended learning'. Blended learning encompasses 'the deliberate, integrated combination of online and offline learning activities.

In the following interview, we would like you to think alike about BE and BL. In this way, we avoid problems interpreting your view or experiences.

Main questions	Prompts (may or may not be used)
1. **Could you tell me how BL got introduced to your university?**	• By whom? • When? • Why?
2. **How is BL currently implemented at your university?**	• How does it fit into technology-enhanced learning or digital innovation inside your institution? • Are there specific disciplines where BL is particularly prominent? If so, why? • What is the estimated percentage of students at your university that are involved in BL courses/ degree programs?
3. **What outcome(s) does the university intend to reach by implementing BL course/degree programmes?**	• quality of education • accessibility of education • flexibility of provision • cost effectiveness • time effectiveness

4. **How does your university ensure that teaching staff have sufficient skills to incorporate BL into their instructional design and delivery?**	• Are staff competences related to BL or TEL considered at recruitment? Any guidelines?
	• What kind support is available to teaching staff (e.g., pedagogical training, technological support, research support, and incentives)?
	• How is the support organized?
	   o general helpdesk?
	   o expertise unit?

Main questions	Prompts (may or may not be used)
5. **How does your university promote BL practices?**	- Are emergent practices shared internally or externally? - How does the university ensure that BL practices are sustainable? - What kinds of resources (e.g., technical infrastructure, software, human support, course development models) are available at the university to support BL or TEL? - Are they sufficient? - What could/should be improved?
6. **How does the university evaluate the quality of BL or Technology-enhanced learning?**	- Is there any specific approach for the evaluation? - Is it different from the evaluation of conventional courses/ programs? - Is the approach determined by accreditation bodies or QA agencies to some extent? - Does the university monitor the quality through research (e.g., collecting and analyzing relevant data at course, program, faculty, and university levels)? - Is there any feedback provided based on the evaluation data? - If yes, who will receive the feedback? - What are the expectations in terms of utilizing the feedback - adjusting educational vision or approach (re)design of courses or programs - and input concerning student or staff support)?

Main questions	Prompts (may or may not be used)
7. **How does the design and delivery of BL courses/ programs consider the needs of students?**	• Is there clear information available to students to orient their choices of courses, e.g., can students see whether a course is blended in the catalogue? • How flexible are the schedules of blended learning courses/ programmes to students? • Do instructors provide targeted support to specific groups of students using BL? ○ How? • How does BL allow instructors to monitor the study progress of different groups of students?
8. **Are there any challenges in the adoption of BL in your institution?**	• Are there any typical problems that teaching staff encounter when applying BL? • Have you observed any resilience to BL among any stakeholders?
9. **What changes have you observed in terms of your institution's readiness for BL over the past few years?**	• With respect to technology? • With respect to teachers and students' attitudes or approaches?

CLOSING QUESTIONS

• What would you recommend to leaders who want to implement a BL approach at their institution?
• Are there any additional institutional issues related to BL that you think that are relevant to our conversation? If so, please share.

DELIVERABLE 3 – REPOSITORY OF PRACTICES