



PROJECT NUMBER:  
LLP-LdV-Tol-2013-RO-  
005/2013



The National Institute for  
Research & Development In  
Chemistry and  
Petrochemistry Bucharest,  
ROMANIA

## *Methodological framework of the blended learning system (BL)*

### **Final version**

## **I. GENERAL PRESENTATION**

### **1. What is blended learning?**

BL is the combination of instruction from two historically separate models of teaching and learning: traditional face-to-face learning systems and distributed learning systems. It also emphasizes the central role of computer-based technologies in blended learning.

BL is combining online and face-to-face instruction. It combines face-to-face instruction (F2F) with computer-mediated instruction (CM, normally e-learning).



Fig.1. BL methodology-general vision



**PROJECT NUMBER:**  
LLP-LdV-Tol-2013-RO-  
005/2013



The National Institute for  
Research & Development In  
Chemistry and  
Petrochemistry Bucharest,  
ROMANIA

In the Figure 2 some solutions to be used to realize BL are presented. Planning, developing, managing, and evaluating a blended learning program is difficult. There are many decisions to be made on a number of key issues that must be taken into account.

Strengths and weaknesses are presented in the Table 1.

The theory is that Blended Learning has the potential of offering courses or training that, through the wise choice of the blend, can have results that are better than the sum of the parts.

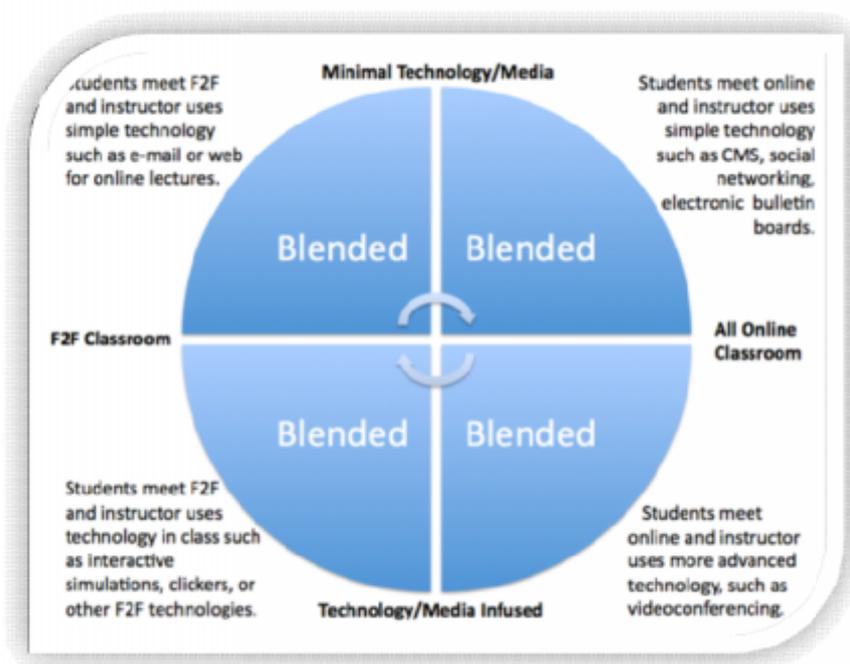


Fig. 2. Solutions to realize BL

Table 1. Strengths and weaknesses

	<b>Computer-Mediated Environment</b>	<b>Face-to-Face Environment</b>
<b>Strengths</b>	<p><i>Flexibility:</i> Students can contribute to the discussion at the time and place that is most convenient to them.</p> <p><i>Participation:</i> All students can participate because time and place constraints are removed.</p>	<p><i>Human connection:</i> It is easier to bond and develop a social presence in a face-to-face environment. This makes it easier to develop trust.</p>



PROJECT NUMBER:  
LLP-LdV-Tol-2013-RO-  
005/2013



The National Institute for  
Research & Development In  
Chemistry and  
Petrochemistry Bucharest,  
ROMANIA

	<i>Depth of reflection:</i> Learners have time to more carefully consider and provide evidence for their claims and provide deeper, more thoughtful reflections	<i>Spontaneity:</i> Allows the generation of rapid chains of associated ideas and serendipitous (by accident) discoveries
Weaknesses	<i>Spontaneity:</i> Does not encourage the generation of rapid chains of associated ideas and serendipitous discoveries	<i>Participation:</i> Cannot always have everyone participate, especially if there are dominating personalities.
	<i>Procrastination (postponing the activity):</i> There may be a tendency toward procrastination	<i>Flexibility:</i> Limited time, which means that you may not be able to reach the discussion depth that you would like.
	<i>Human connection:</i> The medium is considered to be impersonal by many which may cause a lower satisfaction level with the process	

## 2. Why BL?

As one can see in the next figure the BL system responds better to the learners needs.

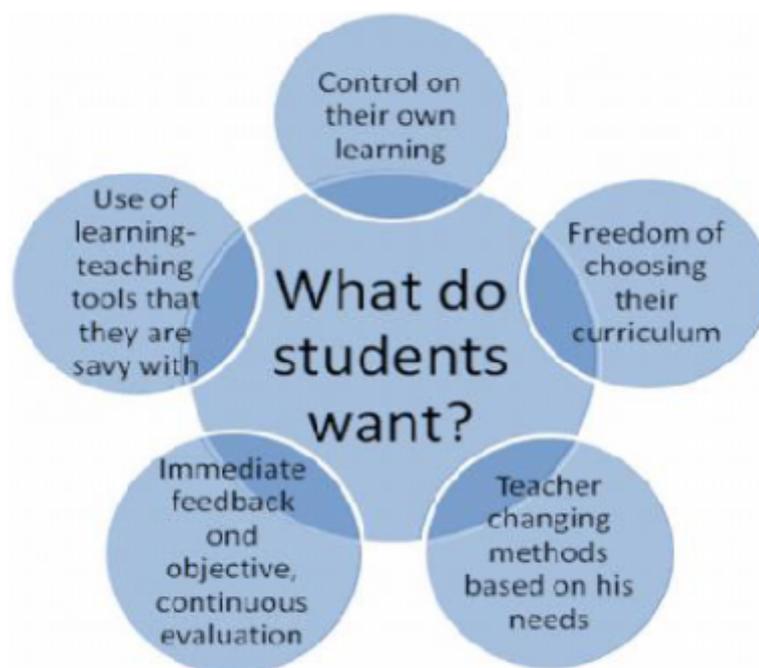


Fig. 3. The students / learners needs



**PROJECT NUMBER:  
LLP-LdV-Tol-2013-RO-  
005/2013**



**The National Institute for  
Research & Development In  
Chemistry and  
Petrochemistry Bucharest,  
ROMANIA**

There are many reasons that an instructor, trainer, or learner might pick blended learning over other learning options. Osguthorpe and Graham (2003) identified six reasons that one might choose to design or use a blended learning system: (1) pedagogical richness, (2) access to knowledge, (3) social interaction, (4) personal agency, (5) cost-effectiveness, and (6) ease of revision. In the BL literature, the most common reason provided is that BL combines the best of both worlds. Although there is some truth to this, it is rarely acknowledged that a blended learning environment can also mix the least effective elements of both worlds if it is not designed well. Beyond this general statement, Graham, Allen, and Ure (2003, 2005) found that, overwhelmingly, people chose BL for three reasons: (1) improved pedagogy, (2) increased access and flexibility, and (3) increased cost-effectiveness.

### **3. Training needs and challenges in SME's**

The Oxford Group and Kineo working together on blended solutions; early in 2013 they decided to carry out a research project. They wanted to explore the current use of blended learning, best practice and the challenges facing those adopting a blended approach to learning & development. As part of this research they surveyed a wide range of companies, asking a structured set of questions to build up a picture of how they use blended learning and the trends they are seeing, as well as to gather examples of best practice and learning.

About the most successful blended learning solution that they have introduced into their organization:

- The examples ranged from all-staff programs to those focused on people in specific roles;
- They covered a wide range of learning objectives, e.g. product knowledge, operational training **and leadership & management skills**

The popularity of the learning methods used tended to mirror the more general responses (i.e. the most popular elements to appear in their example blends are e-learning, face-to-face training and access to learning resources; the least popular elements are mobile and action learning sets).

Changing business environments and global market crisis are challenging SMEs in every country. In order to keep pace with these challenges SME must:





PROJECT NUMBER:  
LLP-LdV-Tol-2013-RO-  
005/2013



The National Institute for  
Research & Development In  
Chemistry and  
Petrochemistry Bucharest,  
ROMANIA

- be innovative
- be able to manage knowledge
- have well qualified staff.

Colin Steed (2011) in “Live BL learning for improved business performance” mentions following benefits of collaborative blended learning in SME:

- Shorter and more focused courses
- Courses more interactive and collaborative
- Greater opportunity to practice either in groups or individually
- Ability to share with other learners
- Ability to learn without having to leave the place of work
- Ability to learn at a convenient time
- More likelihood of receiving "just in time" learning
- Probability of being trained more often and in a more timely way.

#### 4. BL methodology

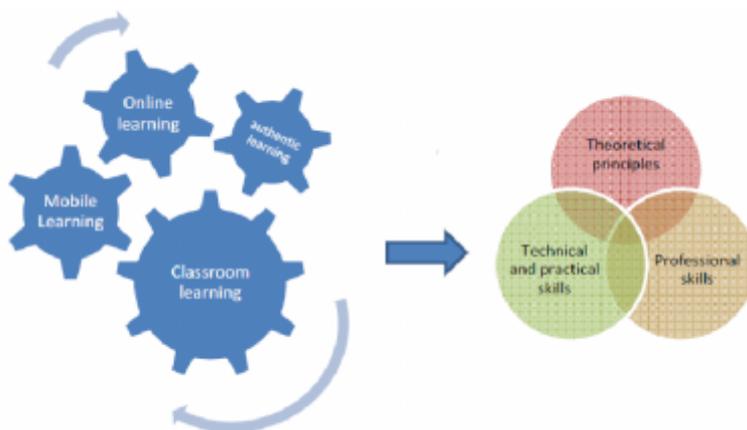


Fig. 4. BL methodology

##### A. Blending at Many Different Levels





PROJECT NUMBER:  
LLP-LdV-Tol-2013-RO-  
005/2013



The National Institute for  
Research & Development In  
Chemistry and  
Petrochemistry Bucharest,  
ROMANIA

All of the BL examples occur at one of the following four levels: **activity level, course level, program level, or institutional level**. Across all four levels, the nature of the blends is determined by the learner or the designer or instructor.

**Activity-Level Blending.** Blending at the activity level occur when a learning activity contains both face-to-face and CM elements.

**Course-Level Blending.** Course-level blending is one of the most common ways to blend. It entails a combination of distinct face-to-face and CM activities used as part of a course. Some blended approaches engage learners in different but supportive face-to-face and CM activities that overlap in time, while other approaches separate the time blocks so that they are sequenced chronologically but not overlapping.

**Program-Level Blending.** Blending at a program level often entails one of two models: a model in which the participants choose a mix between face-to-face courses and online courses or one in which the combination between the two is prescribed by the program.

In the corporate arena, BL is often applied to a particular training program, as was the case with Oracle's Leader Track training, Avaya's Executive Solutions Selling Business Acumen program, and cases of the training programs provided by Microsoft.

**Institutional-Level Blending.** Some institutions have made an organizational commitment to blending face-to-face and CM instruction. Many corporations as well as institutions of higher education are creating models for blending at an institutional level. IBM and Sun Microsystems are corporate examples of organizations with institutional models of blended learning.

For the institution to be engaged in blended learning there must be a concerted effort to enable the learner to take advantage of both ends of the spectrum. It is not sufficient for the institution to have a distance learning division that is largely separate from the on-campus operations.

Blended learning is implemented in a variety of ways, ranging from models in which curriculum is fully online with face-to-face interaction to models in which face-to-face classroom instruction is integrated with online components that extend learning beyond the classroom. The rapid growth of blended learning has been a catalyst for additional instructional transformation, including:





PROJECT NUMBER:  
LLP-LdV-Tol-2013-RO-  
005/2013



The National Institute for  
Research & Development In  
Chemistry and  
Petrochemistry Bucharest,  
ROMANIA

- Evolving pedagogy in which trainers' roles include facilitation, student mentoring and differentiating instruction for individual learners,
- Increased flexibility and personalization of students' learning experiences, and

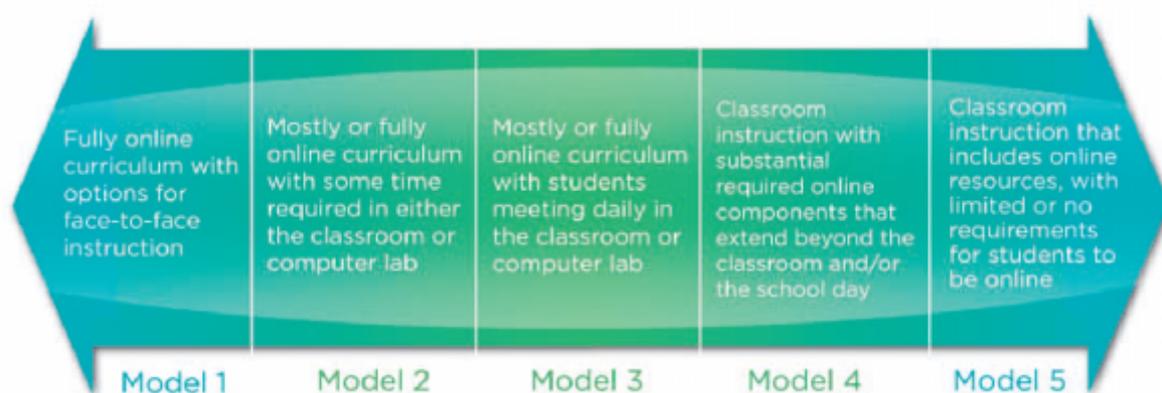


Fig. 5. Model of BL

- Strategic uses of technology as districts tap the capabilities of the learning management systems to support a wider range of instructional programs.

## 5. Important advices for designing BL

10 important 'tips' to think about:

**Tip 1** All good blends have a spine

**Tip 2** Be systematic in your blended design process

**Tip 3** Work out your assessment strategy right from the start

**Tip 4** Use personas

**Tip 5** Keep asking why

**Tip 6** 70:30—a blend formula?

**Tip 7** Think of a blend as a learning journey



**PROJECT NUMBER:**  
LLP-LdV-Tol-2013-RO-  
005/2013



The National Institute for  
Research & Development In  
Chemistry and  
Petrochemistry Bucharest,  
ROMANIA

**Tip 8** Test your blend

**Tip 9** It doesn't stop after you have designed your blend

**Tip 1** Manage the campaign

Table 2. The types of learning that may be used:

<b>Live face-to-face (formal)</b> * Instructor-led classroom * Workshops * Coaching/mentoring * On-the-job (OTJ) training	<b>Live face-to-face (informal)</b> * Collegial connections * Work teams * Role modeling
<b>Virtual collaboration/synchronous</b> * Live e-learning classes * E-mentoring	<b>Virtual collaboration/asynchronous</b> * Email * Online bulletin boards * List serves * Online communities
<b>Self-paced learning</b> * Web learning modules * Online resource links * Simulations * Scenarios * Video and audio CD/DVDs * Online self-assessments * Workbooks	<b>Performance support</b> * Help systems * Print job aids * Knowledge databases * Documentation * Performance/decision support tools

**Source:** Strategies for Building Blended Learning, By Allison Rossett, Felicia Douglass, and Rebecca V. Frazee

**Six major issues are relevant to designing blended learning systems:** (1) the role of live interaction, (2) the role of learner choice and self-regulation, (3) models for support and training, (4) finding balance between innovation and production, (5) cultural adaptation, and (6) dealing with the digital divide.





PROJECT NUMBER:  
LLP-LdV-Tol-2013-RO-  
005/2013



The National Institute for  
Research & Development In  
Chemistry and  
Petrochemistry Bucharest,  
ROMANIA

***The Role of Live Interaction.*** Under what conditions is human interaction important to the learning process and to learner satisfaction with the process? When CM and face-to-face elements were combined, learners often placed a greater value or emphasis on the face-to-face aspects of the experience.

***Role of Learner Choice and Self-Regulation.*** How are learners making choices about the kinds of blends that they participate in? Learners are primarily selecting blended learning based on convenience and access. But this begs questions about the type and amount of guidance that should be provided to learners in making their choices about how different blends might affect their learning experience. Online learning components often require a large amount of self-discipline on the part of the learners. It is about the challenge that many students have in regulating their own learning without the close guidance of an instructor.

***Models for Support and Training.*** There are many issues related to support and training in blended environments, including (1) increased demand on instructor time, (2) providing learners with technological skills to succeed in both face-to-face and CM environments, and (3) changing organizational culture to accept blended approaches. There is also a need to provide professional development for instructors who will be teaching online and face-to-face. It is important to see more successful models of how to support a blended approach to learning from the technological infrastructure perspective as well as from the organizational (human) perspective.

***Digital Divide.*** The divide between the information and communication technologies available to individuals and societies at different ends of the socioeconomic spectrum can be great. Yet e-learning is a strategy that might be considered for Blended Learning Systems educating the learners because of its low cost and ability to be distributed widely.

***Cultural Adaptation.*** What role can and should blended approaches play in adapting materials to local audiences? One strength of e-learning is the ability to distribute uniform learning materials rapidly. Yet there is often a need for customizing the materials to the local audience to make them culturally relevant.

***Balance Between Innovation and Production.*** In design, there is a constant tension between innovation and production. On the one hand, there is a need to look to the possibilities that new





**PROJECT NUMBER:  
LLP-LdV-Tol-2013-RO-  
005/2013**



**The National Institute for  
Research & Development In  
Chemistry and  
Petrochemistry Bucharest,  
ROMANIA**

technological innovations provide, and, on the other hand, there is a need to be able to produce cost-effective solutions. However, due to the constantly changing nature of technology, finding an appropriate balance between innovation and production will be a constant challenge for those designing blended learning systems.

### **Other recommended solutions**

**How to manage instructional complexity:** In blended learning the instructor has a wider choice of delivery mediums to combine. With that wider choice also come greater complexity and pressure on the instructor and designer. This is due to the variety of combinations of technology and possibly the lack of patterns to follow for that particular mix. These issues need to be addressed up front and taken into account during the design. We also need to take this into account due to its effects on the learner. It is easier to finish an online module and start another online module, for example, than it is for that second module to be videoconferencing based. Such changes require the learner to adapt. Time, guidelines, and even brief demos might need to be provided for the learner.

**How to manage the roles and responsibilities:** Unlike traditional classroom learning in which there usually is a single instructor, in blended learning you might have multiple individuals, each taking a modality or role in the blend. Up front clarification of instructor and assistant roles is essential for success and the reduction of potential conflict and learner confusion.

**How to create a seamless learning experience:** Good communications among instructors and careful planning is another important element in the success of blended learning. Make sure that instructors and assistants communicate with one another throughout the instruction, not just before the course. Make sure that as different segments of the blend are designed, all prerequisites are met by the previous learning objects. Arrange learning objects or alter meeting times to insure each segment reinforces the previously acquired knowledge or skill and introduces new concepts seamlessly in spite of the different modality of delivery.



**PROJECT NUMBER:  
LLP-LdV-Tol-2013-RO-  
005/2013**



**The National Institute for  
Research & Development In  
Chemistry and  
Petrochemistry Bucharest,  
ROMANIA**

**How to meet expectations:** As with any new technology, there are those that endorse it and there are lagers. While many perceive the lagers to be difficult, a greater challenge is posed by overly eager fast endorsers. These overly eager individuals tend to overestimate the benefits and make others develop false expectations. Manage the expectations carefully so you can meet them and have success. Management of expectations is also important for instructors and learners to realistically perceive the benefits and work to be performed during the training or course.

**How to control costs and meet ROI goals:** Blended learning offers great flexibility and great effectiveness as it can chose the best medium for every objective; however, the challenge is to make the blend not only effective but also efficient. In cases where multiple instructors are used it is natural for each to perceive their part of the blend with disproportionate importance. As a result, without controls, ROI will suffer. From the design stage put in place cost controls that work hand in hand with quality assurance and learning effectiveness measures.

## **II. ANALYSIS OF THE BL TO BE CHOSEN FOR BELA PROJECT**

### **1. Training package characteristics proposed for BELA project**

The training package proposed for BELA project has several main characteristics:

1. It will offer training for the development of competences comprised in the BELA matrix of competences, determined by the survey realized in the 3 involved countries by disseminating a specific questionnaire to the target groups.
2. The training will have an important orientation towards sustainability, meaning that after the project end the training will continue on request, so an important e-learning platform is to be maintained and interested target person' access to it will be possible by paying a small fee to be used to assure the platform maintenance. In this respect an asynchronous e-learning system is useful; it will assure e-mail contact with the trainers each time is needed.
3. But in order to emphasize the Blended learning context the face to face part will be also maintained, on request also, by delivering the training both as electronic documentation



**PROJECT NUMBER:  
LLP-LdV-Tol-2013-RO-  
005/2013**



**The National Institute for  
Research & Development In  
Chemistry and  
Petrochemistry Bucharest,  
ROMANIA**

or by mentoring assured by the trainer with targeted advice or explanations or factual exercises about the topics of interest for the learner.

4. BELA matrix put into evidence the need to test and to determine the personality characteristics that are the basis to build the future career as a bio entrepreneur.
5. Finally some other skills and abilities are to be developed to become a successful bio entrepreneur.

## **2. The structure of the Blended learning package to be built for BELA project**

All these issues were analyzed and discussed during the partnership meeting in Kaunas, LT, and finally the adopted solution will be the following:

- a. The training content “*Enterprise business and intellectual property in life sciences*” will be entirely adapted to asynchronous e-learning and the expertise of the LT partner in the previous project REMARK to be transferred will be applied.
- b. The training content “*Sustainable Life sciences applications*” will be adapted as a blended learning product, meaning:
  - *The module 1: Sustainable innovative small business or sustainable life sciences applications, and the conclusions: Vision for a better future* will also be adapted to asynchronous e-learning;
  - The other remaining modules will be delivered as face to face learning.
- c. There will be a selection of free of charge entrepreneur personality tests chosen from the huge offer existing on the web, indicated by links towards the sites of interest.

The FR partner will prepare an adaptation of previous project achievements to be delivered as 2 modules:

- a. Module 1: How to register my business in a sustainable development by addressing the five goals?
- b. Module 2: How to network and partnership



**PROJECT NUMBER:  
LLP-LdV-Tol-2013-RO-  
005/2013**



**The National Institute for  
Research & Development In  
Chemistry and  
Petrochemistry Bucharest,  
ROMANIA**

The partner will also indicate how to integrate these modules in the Blended learning ensemble to be designed for BELA project.