

EDUCATIONAL MANAGEMENT IN THE FIELD OF LIFE SCIENCES - BLENDING LEARNING FOR BIOENTREPRENEURS TRAINING

Nicoleta RADU¹, Ana Aurelia CHIRVASE¹, Narcisa BABEANU², Ovidiu POPA²

¹I.N.C.D.C.P. Bucharest, Biotechnology Department, 202 Splaiul Independentei Street, Bucharest, Romania, Phone: +4073.072.86.94; E-mail: nicolbiotec@yahoo.com

²University of Agricultural Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, 011464, Bucharest, Romania, Phone: +4021.318.25.64, Fax: + 4021.318.25.67 Email: secretariat@biotehnologii.usamv.ro

Corresponding author: nicolbiotec@yahoo.com

Abstract

The paper aimed to develop a curriculum to be delivered to a target-group. The methodology used in the training of the target group was represented by the field survey analysis, which contains specific questions for the entrepreneurs from the field of life sciences. The survey analysis revealed that 97% of the respondents were interested to accumulate technical skills and knowledge regarding Business Management. Taking into account the respondents' wishes and expectations, and the usual methods used in this case, it was concluded that the most adequate method to develop and deliver the content of curriculum within the BELA project is to use the both learning methods: the face to face model, and the e-learning model; therefore, a blending learning methodology. The structure of the Blending learning package developed within the BELA project included: (i) the training content named "Enterprise business and intellectual property in life sciences, which is entirely adapted as e-learning, and (ii) the training content of "Sustainable Life Sciences Applications", which is adapted as a blending learning product.

Key words: *blending learning, life science, training*

INTRODUCTION

Blending 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 with computer-mediated instruction. There are many reasons that an instructor, trainer, or learner might pick blended learning over other learning options. Allen, Graham and Osguthorpe [1,2,3] 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. Beyond this general statement, Allen, Graham, and Ure [3] found that, overwhelmingly, people chose BL for three reasons: (1) improved pedagogy, (2) increased

access and flexibility, and (3) increased cost-effectiveness. 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. The popularity of the learning methods used tended to mirror the more general responses. Changing business environments and global market crisis are challenging SMEs in every country. In order to keep pace with these challenges SME must:

- be innovative
 - be able to manage knowledge
 - have well qualified staff.
- Steed [4] 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.

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. **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 (computer-mediated instruction) and face-to-face elements were combined, learners often placed a greater value or emphasis on the face-to-face aspects of the experience. **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.

MATERIALS AND METHODS

In order to establish the methodology which will be used in the training of target groups regarding business management in the life sciences, we used a survey analysis, regarding the needs and expectation of the target group. The survey analysis used here are based on answers to some specific questions, at which were invited to responds the persons which comprise researchers who are preparing to pass from research to business sector, managers of company which activate in the fields of life sciences and teachers involved in training of business management. All the responses received, was analysed and reported to 100%. The structure of the Questionnaire used is presented in the Table 1 and Table 2.

Table 1. Bio entrepreneur competencies characterisation - Technical skills

TECHNICAL SKILLS
Technological knowledge about manufacture of bio products and specific services
Technological knowledge about industrial life sciences sustainable applications
Intellectual Property Rights specific to bio economic sector
Multi disciplinary and cross disciplinary characteristics of life sciences
Innovation development based on R & D in life sciences sector
Training model: Training by transfer of knowledge in now-a-days systems: <ul style="list-style-type: none"> • face to face learning, • e-learning, • blended learning or other advanced ICT technologies

Source: [5,6,7,8].

Table 2. Bio entrepreneur competencies characterization - Management and Business knowledge

JUDGMENT AND APPROACH
Project financial set up and evaluation
Elaboration of a business plan, capacity of building organizations and staff teams and developing them by inter-company cooperation and cooperation between companies and academia.
Business intelligence
Methods to access to financing, long-term and venture capital financing, (big challenge for R & D, innovation, and science-based companies, where the inherent risk of innovation is high)
Assessment of the market of a product and payment mechanisms within the field of life sciences sustainable applications industry
Manufacturing and commercialization methods and sale agreements making
Economic and social models or regulatory issues developed by the authorities from a national and international perspective
Training model Training by transfer of knowledge in now-a-days systems: <ul style="list-style-type: none"> • face to face learning, • e-learning, • blended learning or other advanced ICT technologies

Source: [5,6,7,8].

RESULTS AND DISCUSSIONS

The survey analysis results are shown below.

In terms of competencies characterization of Management and Business Knowledge in the field of life sciences (Figure 1) required of an entrepreneur, we found the following:

- 98% of respondents need the abilities of manufacturing and commercialization;
- 100% of respondents consider useful to have a deeper understanding and knowledge to assess the market of the products and the mechanisms of payment;
- all the respondents have need of adequate knowledge regarding financial evaluation of the projects;
- 100 % of respondents consider important the technical, practical and ethical issues for using the management and analysis tools of their company;
- 100% of respondents consider important to have depth knowledge regarding understanding the economic sector and social models, regulatory issues and requirements of authorities from national and international perspective;
- all respondents are interested to know how to get the access to financing, especially long term and venture capital financing.

In terms of Technical skills in the field of life sciences (Figure 2) required of an entrepreneur, we found the following:

- 98% of respondents are people, who consider as necessary the proper knowledge and understanding of Intellectual Property Right,
- 89% of respondents consider having need of deeper knowledge about technologies which can generate products and services;
- 98% are interested to have deeper knowledge regarding industrial sustainable applications in the field of life sciences;
- 97% of respondents have needed a deeper knowledge of the multidisciplinary and cross-disciplinary characteristics in the life sciences. Based on this analysis, in which 97 % of respondents are interested to accumulate the knowledge regarding Technical skills and Business Management and taking into account the methods indicated into literature in order

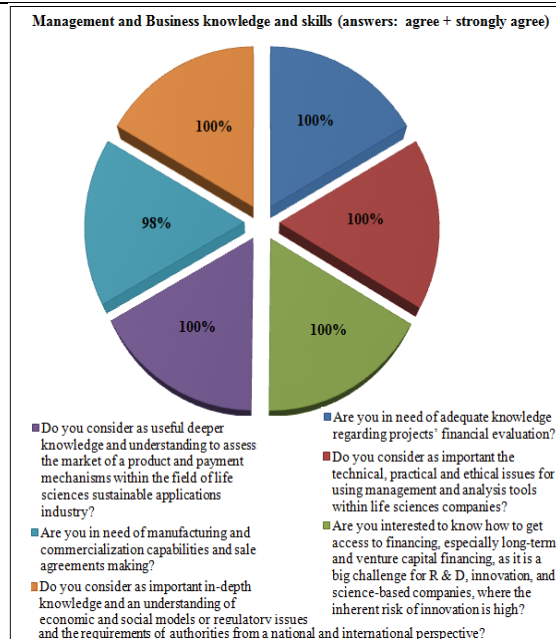


Fig. 1. Management and Business Knowledge

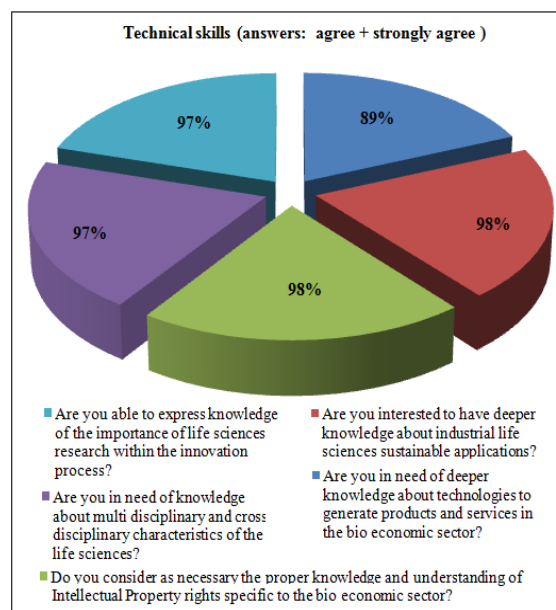


Fig. 2. Technical skills

to transfer the knowledge in now-a-days systems, [5-8] the most adequate methods is the face to face, and the e-learning models, respectively a blended learning methodology. So, based on interests showed by target group (indicate by survey analysis), the structure of the Blended learning package to be built for BELA project will be the following:

- the training content “Enterprise business and intellectual property in life sciences” will be entirely adapted to e-learning;
- the training content “Sustainable Life sciences applications” will adapt 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.

CONCLUSIONS

Based on this analysis, in which 97 % of respondents are interested to accumulate the knowledge regarding Technical skills and the Business Management, the properly method to make this is the face to face and e-learning models, which corresponding to the blended learning methodology.

The structure of the Blended learning package to be built for BELA project will be the following: 1) the training content “Enterprise business and intellectual property in life sciences” will be entirely adapted to e-learning and the expertise of the foreign partners; 2) the training content “Sustainable Life sciences applications” will adapted as a blended learning product.

ACKNOWLEDGEMENTS

The paper was supported by the project entitled: *Improved Curricula and Modern Learning System to Promote the New Directions of Business Enhancement in Life Sciences Applications*, Lifelong Learning Programme Leonardo da Vinci - Transfer of Innovation, project no: 2013-1-RO1- LEO05-28758. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

REFERENCES

- [1]Allen, S.D., Graham, C.S., Ure, D. 2003, Blended learning environments: A review of the research literature, unpublished manuscript, Provo, UT, 2003.
- [2]Graham, C.R., Osguthorpe, R.T., 2002, Blended Learning Environments: Definitions and Directions. Quarterly Review of Distance Education 4 (3), 227-33.
- [3]Graham, C. R., Osguthorpe, R.T., Russell, T., 2003,

Blended Learning Environments: Definitions and Directions, Quarterly Review of Distance Education, Volume 4, Number 3.

[4]Leutner, F. G., Ahmetoglu, R., Akhtar, T.C., 2014, The relationship between the entrepreneurial personality the Big Five Personality traits, Personality and Individual Differences, 63, 58-63.

[5]Steed, C., 2011, Facilitating Live Online Learning, Publisher: Engaged Online Learning, 2011.

[6]www.forbes.com/2010/08/02/entrepreneur-personality.

[7]www.davincimethod.com/entrepreneur-test.

[8]www.potentielentrepreneur.ca/client/questionnaire.