

ICT serves Business Training: Implementing Life-Long-Learning

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Abstract — Much of the economic activity and most of the employment in EU countries is provided by SMEs, Small and Medium Enterprises. The most vibrant sector that promises a good prospect for future growth is that of ICT and other Technologies. These companies employ a high proportion of University graduates many of them from science and engineering, subject areas in which new knowledge is constantly being generated. How are these workers to be kept up to date? Traditional training is giving way to Life-long-learning and for high tech companies whose workers have good ICT skills e-Learning can be effective and efficient, but planning and implementation must be carefully carried out to enable new knowledge to be harnessed to meet business needs. This paper sets out a tried and tested process in e-Learning planning and implementation for SMEs based on a holistic approach firmly rooting LLL at the core of strategic planning.

Index Terms — Business Planning, Education, Educational Technology, Learning Systems, Training

I. INTRODUCTION

One effect of the emergence of the global knowledge-based economy is the need for enterprises to work hard to maintain their competitive advantage, leading to an awareness of the value to an enterprise of its collective knowledge and the importance of a sustainable, continuing learning and development process for its staff.

The future of many companies depends on the ability of their staff to learn how apply their knowledge to acquire the competences to adapt to constantly changing environments [1].

“The only thing that gives competitive advantages to an organisation is what it knows, how it uses that knowledge and how fast it can learn something new” [2]. That means organisations should develop a strategy of continuous learning integrated in their work and business environments.

A Life Long Learning (LLL) strategy based on e-Learning can be the answer to the needs of today's organisations: for geographically distributed workforces, for acquiring knowledge which changes fast, for increased productivity, and for “just in time” learning [3].

Many European companies, particularly small and medium ones (SMEs), have particular difficulties in facing today's business challenges, they are not ready for combined effects of, significant international social and economic changes, globalization, the difficult financial situation worldwide, increased market competition, and need for technological innovation. Upskilling through a LLL strategy encompassing e-Learning taking advantage of its flexibility

and adaptability can bring advantages to the SMEs [4].

Investigations, such as the EU funded ARIEL project (www.ariel-eu.net), show that the use of e-Learning in European SMEs is very low, and those early attempts at adoption in both SMEs and larger companies often failed. Further, the SIMPEL project (www.simpel-net.eu) showed that one of the most critical and important aspect was an evaluation of an organization's e-Learning readiness. Many companies having to make the decision whether or not to integrate e-Learning into their vocational and life-long learning strategy do not know if the company, its staff, and infrastructures are “ready” for this or not. Implementing and maintaining a LLL strategy is a rather complex process, many factors have to be taken into consideration: the company's learning culture, vision, processes and technologies, staff and new knowledge and skills requirements.

A model is needed so that organizations, including SME, can evaluate their readiness to implement or further exploit LLL based on e-Learning. Two initial steps are necessary, an evaluation of existing training and development strategies and an evaluation of e-Readiness (the ability of the organisation to use the internet for tasks, such as communication and cooperation). The e-Maturity of the organisation (i.e. a high degree of e-Readiness) can contribute substantially to the readiness for e-Learning, as does the level of e-Competence of individual employees.

The purpose of this paper is first to define factors which influence the successful adoption of e-Learning in order to build a readiness model that will assist in determining what should be done in order to prepare the staff, trainers and organisation for a shift to e-Learning based LLL.

Secondly the paper presents the next step by including the results of e-Learning readiness evaluation into the development of a LLL strategy that supports the business and work objectives of the organisation.

Thirdly the paper presents an example drawn for the experience of the authors.

II. E-LEARNING READINESS MODELS

The Economist Intelligence Unit [5] cited by [6] published some models of e-Learning readiness.

Rosenberg [7] identified the following four factors - the “Four Cs for Success”: Culture, Champions, Communications, and Change. He considers corporate-policy factors very important for the success of an e-

Learning project: an open learning culture, managerial support of the project, successful communication of the project and its advantages to the staff, and a change process which integrates these factors into the further development of the organisation and of its staff. These elements have to be clarified before a project starts in order to assure its success.

He developed 20 key-questions which were classified in the categories: entrepreneurial readiness, changing nature of learning and e-Learning, value of teaching and information design, management of change, re-invention of educational organisation, industry of e-Learning and personal commitment.

Chapnick [8] considers that the main readiness factors for the implementation of e-Learning are psychological readiness, sociological readiness, environmental readiness, readiness of the human resources and economic readiness.

Broadbent [9] affirms that the successful implementation of e-Learning in an organisation requires the right people, the right place and the right resources.

The following factors are considered by Workknowledge [10] as important when implementing e-Learning: readiness of the staff, readiness of administration, economic readiness, environmental readiness, technological readiness and readiness of the culture.

Borotis and Poulymenakou [11] suggest seven factors that should be checked before an e-Learning solution is adopted including entrepreneurial readiness, readiness of content, technological readiness, readiness of culture, of human resources and economic readiness.

We would like to add a further two models of e-Learning readiness.

Habermann and Kraemer [12] identify (similarly to Rosenberg but more from a methodical point of view): five typical problem fields previously to a project which can influence the strategic and operative planning: problems of complexity, information, resources, decision and of coordination.

Stacey [13] prefers professional-content aspects. His "Big 8 questions to answer in Planning and Implementing E-Learning" contain questions of organisational and didactical processing as well as some aimed to measuring success.

Psycharis correlates the factors of e-Learning readiness mentioned in the literature and classifies them into 3 major categories (Figure 1):

All these models group factors under specific areas e.g. technological readiness, human resource readiness, etc. but the underlying features of the different models are appreciatively the same. All the authors regard e-Learning projects as being associated with needed organisation development and organisational integration rather than based on technical implementation processes but more of.

The models add value in structuring the factors that need to be investigated before an e-Learning project starts. Key observations within these models specific to SMEs are:

- Will e-Learning be the best choice for training delivery?
- Special pedagogical requirements and face-to-face contact must be neglected,
- The assessment of organisational readiness is a difficult for SMEs (particularly for micro-business),

- Models are a guide only they need tailoring before, during and after the e-Learning event,
- SME managers may need the help of trainers and other outside specialists,
- Some models are oversimplified so don't comprehensively prepare for e-Learning.

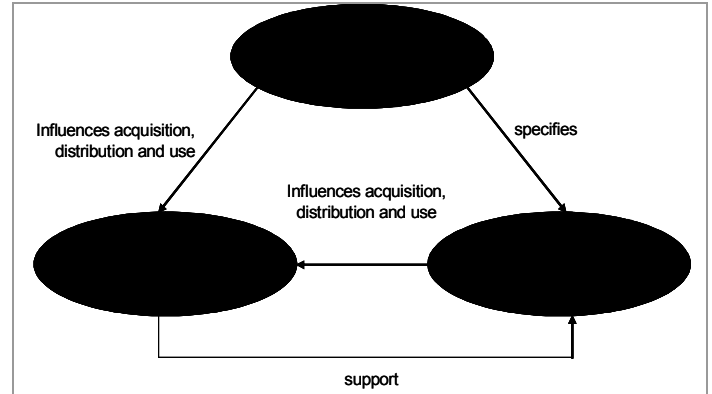


Figure 1. Criteria of readiness and correlation between them (© Psycharis 2005).

III. EVALUATION OF E-LEARNING READINESS

e-Learning readiness, which describes as accurately as possible the situation relating to organisation, technology, human resources and professional content at the time of an e-Learning project decision, can be determined (and to a certain degree standardised) by the use of check lists.

Our model puts forward questions for the evaluation of e-Learning readiness in a reference catalogue taking into consideration the main criteria Organisation/Management, Technology/Services, Staff/Human Resources.

The main objective in the use of this catalogue is to generate information for the development of the e-Learning readiness model and a sustainability strategy by determining the necessary project steps, identifying project participants and by evaluating project costs. Additionally at this stage negative factors such as lack of senior management support or an over complex project structure are made visible (see [7] [12]).

Our reference catalogue, with additional questions relating to the e-Maturity of the company, should be applied to create a profile of the company under the three main headings, the results preferably being evaluated by an e-Learning consultant and completed in direct discussions with the staff and management of the company. This then becomes the basis for the next step - building an e-Learning strategy.

The reference catalogue we used in our project includes the following categories and questions.

Organisation/Management

Strategic and economic readiness

- What are the strategic objectives and reasons for implementing/using of e-Learning?
- Are appropriate financial and other resource allocated?

Entrepreneurial readiness

- Are the requirements necessary for a successful implementation of e-Learning fulfilled?

Readiness of culture

- Is the learning culture of the organisation an innovation supporting one?

Management readiness

- Does the company management support the implementation of e-Learning?

Technology, Services

IT readiness

- Is the ICT infrastructure of the company and its external connectivity (broadband) adequate?
- Are PCs and the Web already used for learning and communication by staff?

Readiness of learning environments

- Do staff have access to an existing learning platform?
- Do virtual learning communities exist in the organisation?

Readiness of content

- Is the content to be learned suitable for e-Learning delivery?

Staff/HR

Trainee readiness

- Are staff e-Literate are they familiar with e-Learning?
- Are they motivated and ready to learn?

Trainers, tutors readiness

- Are trainers, tutors competent in the e-Learning environment?
- What is the most familiar training methodology within the company, does it adapt easily to e-Learning?

Readiness of vocational training plans and strategy

- What are the existing plans and tools for staff development in the company?
- Are long term training strategies based on E-Learning?

At this readiness stage the questioning should not attempt to elicit too much detail, staff do not respond well to too complex a questioning process. Leave the detail to the next stage.

IV. BUILDING THE LIFE LONG LEARNING STRATEGY BASED ON E-LEARNING

For many small companies the next phase is planning the implementation steps. For larger companies a detailed LLL strategy is more appropriate. Here we present an "optimal strategy" in application it should be adapted by selecting the suitable or necessary steps.[15]

Analysis of company situation and qualification needs

In the initial phase the current business situation, the future goals and anticipated problem areas are analyzed; this leads to a determination of the knowledge and qualification needs of the staff to enable the goals to be achieved.

Analysis of e-Learning market

Prior to the development of a LLL strategy based on e-Learning an analysis of the existing e-Learning market through contact with learning providers, "drivers" of vocational training processes, networks etc. is required.

Concept

The most complex phase of a LLL strategy is the conception stage. Suitable training offers and services have to be found, learning contents, forms and media evaluated, the relevant knowledge and data flows have to be determined in this phase.

Planning

Planning involves facilitating the implementation and definition of the LLL measures along with determining the timescale, the actors, the technological and organizational infrastructure and the tools needed for an efficient realization. The inclusion of a financial (business) element in the company's LLL strategy, thus providing an economic framework linking to the process level, is advisable. The inclusion of support from national and European aid programmes should be considered. A clear focus at this stage reduces complex events and relationships, thus making learning efficient and provides a basis for future decisions concerning LLL activities in the company.

Implementation

In the implementation phase LLL solutions that correspond to the learning culture of the company will be produced (or purchased and adapted) and introduced. The implementation of LLL based on e-Learning should be supported by internal marketing measures in the company. The aim is an efficient and successful transfer process where trainees can use what they learn in their work tasks.

Evaluation and improvement

In the evaluation phase the company should discover how effective and (financially) efficient the training was. A complete evaluation involves examining human and financial resource utilization, the developed training measures, employee participation, changed practices, increased knowledge, behaviour, competences in the company and the achievement of expectations of the participants in the programme. Multiple methods of evaluation should be applied not only after the implementation but also in the planning stages and in the transfer process. Interim and formative evaluation may lead to necessary modifications or indicate improvements. Quality management and assurance metrics such as ISO/IEC/19796-1/2005 [14] may be appropriate methodologies.

V. EXAMPLE

We applied the above ideas within the activities of the EU project SIMPEL involving researchers, higher educators and other training providers, SMEs, e-Learning experts and providers [15].

Comparative analysis of the results of other projects undertaken by the SIMPEL partners and our analysis of national seminars reveal factors that must be considered when implementing e-Learning as a part of the LLL strategy of the company if it is to be sustainable:

- identification of needed skills/competences which could be achieved by e-Learning,
- readiness for e-Learning (see part 3 above),

- adequate tutor and technical support for education and integration with more traditional forms of learning, learning infrastructures,
- organisational perspective,
- transfer of knowledge,
- economical aspects,
- quality and (self) evaluation criteria.

In SIMPEL the e-Learning readiness model (Figure 2) and an “optimal LLL strategy” (see part 3 above) for an SME

framework will be piloted in a representative sample of SMEs and continuously improved until an optimized model has been created. In combination with the SIMPEL project models and guidelines, this best practice experience in readiness will be disseminated and valorized in regional, national and European workshops and in interaction with LLL experts, SME representative bodies, individual learners, and VET bodies.

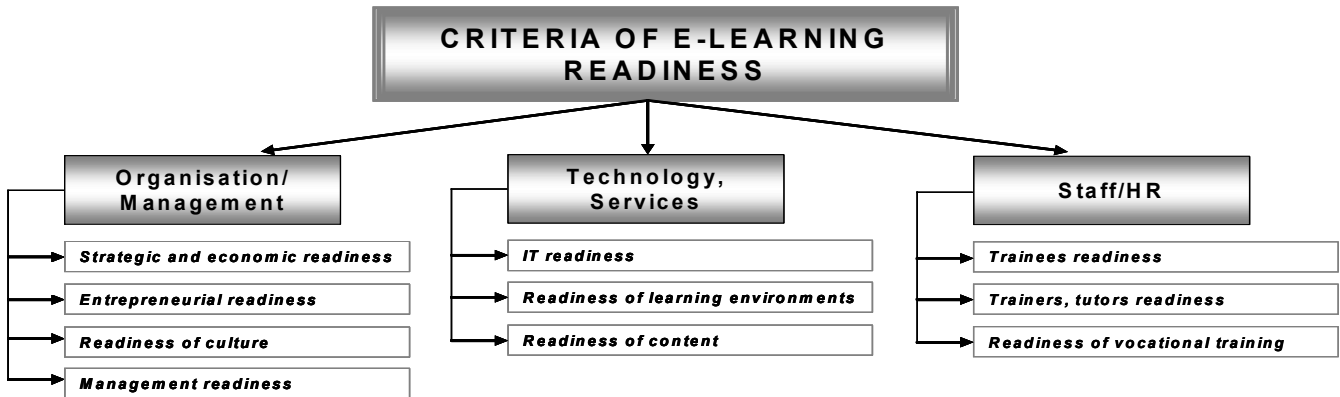


Figure 2. Factors for E-Learning readiness – Project SIMPEL
www.simpel-net.eu.

were developed and tested by using pilot runs within a community of practice supported by a Moodle platform [16]. Guidelines were produced with recommended actions for SMEs and all other actors who are engaged in support and training [17][18].

The next step is the further valorisation transfer of these SIMPEL results in all partner countries. In Germany and Hungary native language e-Learning readiness catalogues are in the development based on the European model created within SIMPEL and using the results of pilot studies. At the time of writing e-Learning readiness studies and implementing LLL based on e-Learning planning within two communities of practice is in progress; one with companies from Ruhr-Area (Germany) and the other from the region Győr-Mosonmagyaróvár-Sopron (Hungary), participants including SMEs, higher education institutions and e-Learning providers.

VI. FURTHER WORK

An important aspect of our future work is to help SMEs develop an open and adaptable attitude to Web-based tools and methods. This can be achieved by initiating corresponding and cooperative projects.

In this context, and with partners from universities and SMEs in Ireland (coordinators), Portugal, Romania and Hungary, the authors started to work within the EU Leonardo project LLL Readiness in SMEs (ReadiSME) an innovation transfer project of best practice and results of successful EU LLL e-Learning and national projects from recent years. ReadiSME focuses on methods of establishing degrees of Web-based LLL readiness in SMEs as part of a company's knowledge management structure. The project will adopt a step-by-step approach to implementing LLL according to different levels of readiness, whilst simultaneously working towards higher levels of readiness. The

VII. CONCLUDING REMARKS

e-Learning can form a valuable approach to upskilling for SMEs but a holistic approach must be taken encompassing the strategic planning of the company, its economic environment, it's support network, it's e-Maturity, the services ICT it enjoys and the regional and national supports available. A carefully planned and implemented yet flexible strategy is required that may need input for outside experts. Nor can e-Learning be isolated it must be integrated within the companies knowledge management strategy.

this section. These specifications are to be included in an unnumbered footnote on the first page of the paper.

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