From «formal» to «informal» e-Learning through knowledge management and sharing

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Abstract

If we had to indicate the themes that have characterised the evolution of e-learning systems in recent years, the choice would very probably fall, on the one hand, on those linked to standards and more in general to technological development, and on the other on what could be called «informal» e-learning, not referred, in other words, to a «formal» educational process designed and run by someone (i.e. the course provider), but that is entrusted to the synergetic and collaborative action typical of professional communities which learn «through the network» and «in a network». In this article, in particular, we will discuss the important role of the interpersonal interaction and the circulation of knowledge that develop within online professional communities. This implies the clear understanding of the best way to use information and communication technologies (ICT) to foster processes of access, management, sharing and capitalisation of knowledge within and outside the communities, and more in general the organisations to which their members belong. These are, in fact, situations where e-learning, or better, a certain type of e-learning, can find considerable impetus for its own growth in quality, by adopting knowledge management and/or sharing tools and techniques.

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1. E-learning, knowledge management and sharing

Dealing with e-learning[1] approaches, generally we refer to «formal» educational processes, based, in other words, on a precise training programme with a beginning and an end, careful orchestration by the provider, and a scaffolding for participants made up of tutors, learning materials, the presence of experts/specialists etc. irrespective of the use of individual, assisted or collaborative strategies.

In this sense, these approaches could be often indicated as «push» types, because the user is driven towards the educational goal.

Increasingly, however, the need to acquire new knowledge rapidly, in order to be able to tackle a specific professional problem, is difficult to reconcile with the implementation times of a «formal training» programme, characterised and marked by a series of canonical phases such as the identification of training needs, instructional design, the development of learning materials, planning of online activities based on online education strategies and, finally, the course delivery.

The problem here is that, no matter how rapidly these stages are conducted, the process from needs identification to completion of formal training will inevitable be too lengthy for the modern organisation; today, firms are forced to react practically in real time as training requirements arise, adopting very specific (personalised) actions applied with almost surgical precision.

The consequence is that training providers are being asked more and more for something halfway between consultancy and training, between responding to a specific problem (as would a consultant) and developing skills and knowledge so that in future the organisation is capable of handling similar problems by itself.

The scenario changes radically, shifting thus from «formal» training, in which the provider assumes a guiding role for users (even when mediated by learning materials), to «on-demand» training, where, instead, the indications on contents to be tackled are provided precisely and selectively by those with training needs.

However, again in this case, although precise indications of the contents are provided by those directly concerned, the training process that follows is the responsibility of someone else (a consultant, a mentor, a tutor etc.): the training approach thus remains effectively a «push» type.

In addition, «on-demand» training, as well as introducing a different cost map compared to «formal» training, does not always guarantee the maximum speed in reacting to the problem.

This leads to the need to find solutions of another kind, less «push» and more «pull», in other words linked to the capacity of the individual to win

[1] In this paper, the author uses the term «e-learning» to indicate the ways of using information and communication technologies to support teaching/learning processes based on the electronic delivery of contents, the use of shared knowledge bases, and on active and/or collaborative learning.

back autonomously, case by case, what is required to help their own process of professional growth.

These solutions are inevitably moulded on the capacity of the individual to access, manage and share both personal and organisational knowledge potentially useful for solving a given professional problem. This is a fairly common approach in *knowledge intensive organisations* (Sveiby, 1992) which are at one and the same time consumers and producers of knowledge and where a strategic role is occupied by the so-called process of «endogenous growth» based on the management, circulation and capitalisation of internal knowledge.

The engine of these knowledge management/sharing dynamics are the professional communities (Trentin, 2002) which, according to their objectives and level of cohesion between their members, may assume the form of working groups, practice or best practice communities (Wenger, 1998), professional interest groups etc. In this case, the individual, in addition to the possibility of using information/knowledge channels of a «vertical» type (from the source of information/knowledge to the direct user), the opportunity is given to be part of «horizontal» communication between professionals (the community), through which specific professional problems can be shared and discussed on a peer-to-peer basis and better solutions found through collaboration.

1.1 From formal training to reciprocal learning

There is a particular way of seeing e-learning that at the beginning we defined as «informal» and that is based on peer-to-peer networked interactions aimed at helping individuals learn reciprocally. These are dynamics typical of those learning processes not linked so much to pleasure or to the need to learn as an end in itself (although possibly also this), but rather as learning how to apply knowledge that can be useful to one's own professional or personal life. Indeed, as andragogy teaches us (Knowles, 1984), it is activity related to a given set of knowledge (especially its application) that is the most effective trigger that drives towards the acquisition of knowledge itself.

In this, the processes of learning, from others and with others, can play a very important role, through the sharing of knowledge and best practices regarding the solution of problems typical of a given professional community.

Extraordinary support for these processes is certainly offered by the combination of information technologies (especially those linked to knowledge management/sharing and also to the concept of the semantic web[2]) with those of

[2] «The Semantic Web is an extension of the current web in which information is given well-defined meaning, better enabling computers and people to work in cooperation» (Berners-Lee et al., 2001).

group interaction (network and groupware technologies) capable of amplifying and giving continuity to interpersonal communication between the members of a scattered professional community.

From a traditional standpoint, it might seem that these processes do not come under the concept of e-learning or at least they lie very much on its edges. We can certainly say that they are in a diametrically opposing position to e-learning based exclusively on learning materials. However, re-reading the definition of e-learning adopted in this article (Trentin, 2003), we find all the key elements, i.e. the use of ICT to convey/manage contents and knowledge, networked learning (understood not only as the physical network but also as the social network of individuals who learn peer-to-peer), active and/or collaborative learning.

1.2 The integrated viewpoint

So far our discussion has been conducted rather provocatively on the evident, almost clamorous, difference that exists between the two extremes within which the various systems of e-learning are located: on the one hand, the consumption of an educational package distributed by someone, and on the other the construction of new knowledge by the users themselves.

In reality, e-learning offers highly diversified scenarios in which both possibilities can co-exist, i.e. where «formal» e-learning is seen as one of the possible ways of acquiring new knowledge by the members of a professional community and where the methods and technologies linked to knowledge management and the semantic web (Berners-Lee et al., 2001; Stojanovic & Handschuh, 2002; Anderson, 2004) are becoming more and more a part of the regular habits of the individual in creating customised solutions for their own information and cognitive needs.

As has been said, learning takes place any time a new problem has to be solved. In general, the search for a solution is put into practice through:

– «rummaging» through a data base and asking those who have more expertise (in the framework of a specific learning environment, trusting in the knowledge of the peers encountered through forums, discussion groups etc.);
– seeking out specific learning resources whose objectives can be related to the problem to solve, in the attempt to identify methods and procedures that can provide a guide in seeking the solution;
– producing original hypotheses (also by collaborating with others through a community) from the perspective of experimenting new solutions that could later be translated into new knowledge with which to integrate the initial knowledge assets (individual and/or of the organisation).

To this end, it is necessary to combine methodological and technological environments in order to mix suitable to the specific situation and to offer the

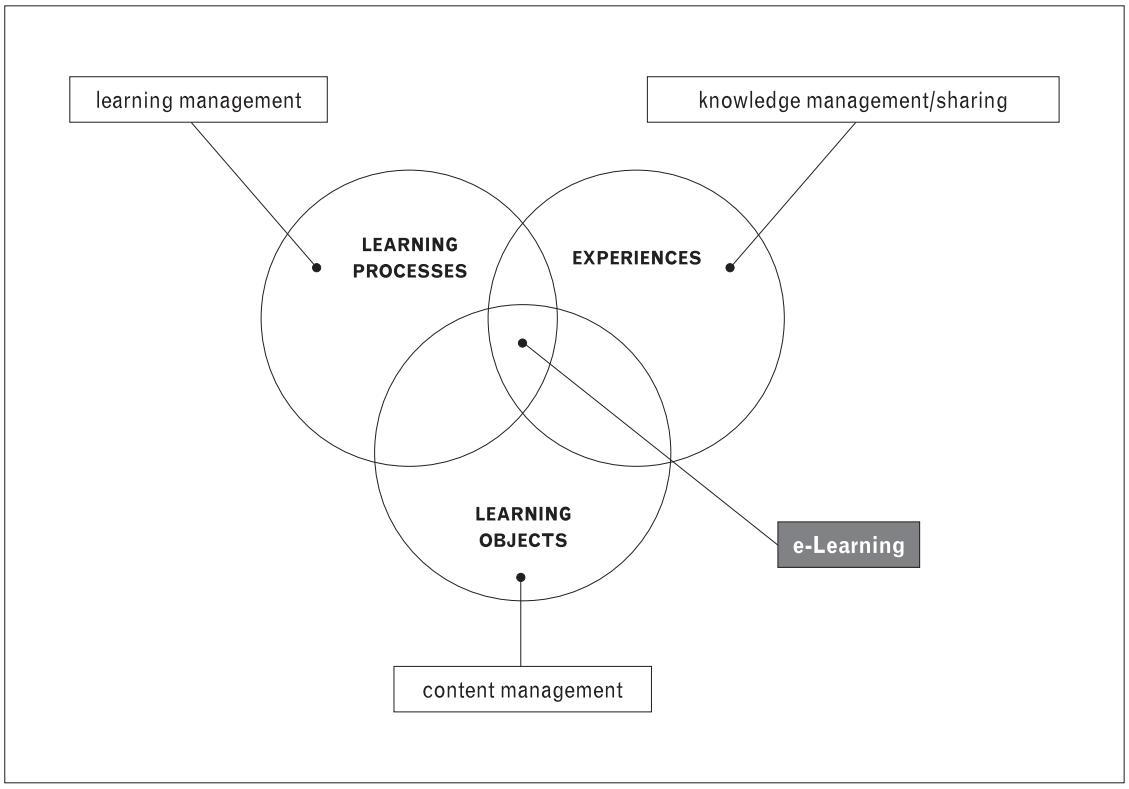

Figure 1 e-Learning as a mix of learning objects, learning processes and sharing of knowledge and experiences.

opportunity, on the one hand, to personalise learning and, on the other, insert it in an organisational rationale (Salis et al., 2002).

Under these conditions, the quality of an e-learning system will be measured increasingly in terms of its capacity to adapt to the needs of the user by offering a range of resources and services, including those not necessarily developed for the specific e-learning process.

In its turn, the teaching quality of the system will also be evaluated in terms of the education of the user both in the individual use of these resources and services and in the capacity to become autonomous in providing for the personal own continuous education in the specific contents domain, once the «formal» e-learning process has been completed.

2. Integrating e-learning and knowledge management/sharing

To understand better what the effects of integration between e-learning and knowledge management could be, it is perhaps useful to recall some key concepts encountered in the previous paragraphs and which Ravet (2002) summarises as follows:

– A learning process consists in the «consumption» of knowledge but also in the «production» of new knowledge.
– A learning process is something more than following a training course; it is a continuous process, an integral part of everyday professional life.
– Managing a learning process is something more than organising a training course, distributing contents and evaluating their understanding through multiple-choice tests.
– Managing learning resources is more than organising learning objects or resources designed and developed for a specific training objective; it also means making the most of the knowledge produced during the learning process itself.
– A means for managing and disseminating knowledge is something more than just mass media; it must be flexible, accessible anywhere and facilitate the interaction between people in the process of sharing knowledge and building common values.
– In addition to going back to these key concepts, it can be useful to compare the specific features of knowledge management with those of learning management, targeting them through some specific indicators (see Table 1).

Table 1
COMPARING KNOWLEDGE MANAGEMENT AND LEARNING MANAGEMENT (RAVET, 2002)

	Knowledge management	*Learning management*
Purpose	To develop the organisation's intellectual capital	To improve the performance of the organisation, groups and individuals
Activities related to knowledge	To recover, capture, store, organise, interpret, represent, transform, transfer and distribute information	To provide links to knowledge that can be useful for the learning process; to encapsulate knowledge in the resources subjected to the learning process; to capture the knowledge produced during the learning activities
Individuals	They are seen as depositories of tacit knowledge, capable of using it and transforming it into performance and explicit knowledge	They are offered learning activities to develop their competencies and performance for the purposes of professional growth
Groups	They share data, experience, best practices and build common values	To develop meanings shared where each person's learning is achieved through group learning
Competencies required	To capture data and information, to transform tacit knowledge into explicit knowledge when this is possible and important	To ensure that learning activities are an opportunity to produce new knowledge, capturing the latter for the future benefit of other training programmes and users

Knowledge technologies and mediators	Systems «learn» from people's activities (data mining[3]) and external inputs	People learn from experience supported by both IT systems and by other people
Strategy	To create a learning organisation	

In other words the integration between learning management and knowledge management/sharing is the key element of a «learning organisation».

However much the expression «learning organisation» (Senge, 1990; Argyris & Schon, 1995) has now become part of our vocabulary, it is always worth specifying and being aware that an organisation does not learn «by itself» but through people.

In this sense, groupware and/or computer conference systems, although not created explicitly as environments for knowledge management, can also play an important role to foster interpersonal interactions, addressed to develop both new individual and organisational knowledge.

In fact, knowledge is not limited to what can be captured in the various documents or databases (the so called «explicit knowledge»). One important dimension on which knowledge managers work is «tacit knowledge»[4] (Nonaka & Takeuchi, 1995; Augier et al., 2001) enclosed in the minds of people in terms of procedures, social interaction, cultural values etc.

The learning environments can, therefore, exploit knowledge management techniques (such as data mining) (Hanna, 2004) to gather and process scattered information, as well as in the organisation's databases, in the exchange of e-mails and documents, in discussion forums etc.

Automated analytical processes can therefore highlight elements on the basis of which to take decisions (Ravet, 2002). For example, the teaching strategies to adopt according to the learning styles inferred from analysis of network interaction, to provide suggestions on which contents to prefer in the offering of e-learning, to create connections between people who, despite not knowing each other, have similar interests etc.

[3] The recovery of information and meanings based on the recognition of specific patterns within a large quantity of data stored in the form of data bases, discussion forums, e-mail systems etc. Data mining, using a combination of various techniques (modeling, statistical analysis, artificial intelligence etc.), identifies models and subtle relations between the data analyzed, inferring rules that enable the formulation of hypotheses and forecasts.

[4] According to Nonaka and Takeuchi (1995), human knowledge is created and developed through social interaction between tacit and explicit knowledge. This interaction is developed in a spiral movement characterized by four phases (1) from tacit to tacit *(socialization);* (2) from tacit to explicit *(externalization);* (3) from explicit to explicit *(combination)* and from explicit to implicit *(internalization).*

3. Conclusions

ICT and knowledge management/sharing techniques can be very effective for capitalising data, experiences and good practices captured during both professional and training activities, later making them available for further learning processes (Maurer & Sapper, 2001; Rosenberg, 2001).

This demands, however, the definition of new technological architectures and processes based on the assumption that learning is continuous and an integral part of everyday professional life. In fact:

– A learning process does not end with the completion of a specific training event; it is possible to maintain the links between the people that have participated (alumni), organise updates and the integration of the shared knowledge base and the support documentation for the training event, create new links between the social network established and the outside world (Trentin, 1997).
– To be successful, learning should be part of everyday activities and be based on the ability to gain access to a wide range of resources, going well beyond just the use of the e-content explicitly designed and developed for the specific training event (Ravet, 2002).
– Learning and knowledge management are integrated processes that involve people, professional activities and appropriate technologies.
– E-learning and knowledge management are not just projects, but endless integrated processes; learning and the sharing of knowledge have equal importance in the construction of an organisation's intellectual capital.

It can therefore be concluded that for quality e-learning, it is crucial to define a strategy in line with the nature and needs of the organisation, together with the knowledge management processes significant for the organisation itself, before even thinking about technology. This is the only way that the synergies between e-learning and knowledge management will provide a real contribution to individual professional development and, as a result, improvement in the performance of the organisation/institution.

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