Preface

Rethinking the Learning Process

Throughout the centuries, the mission of the University has been considered one of teaching, that is, transmitting knowledge from educated scholars to young students. These students were considered matured and skilled enough to be able to cope with the intellectual difficulties in understanding and a sufficient amount of work in applying the concepts, ideas, frameworks, rules, facts, figures, maps, and so forth that build the contents that they had to acquire during their stay on the university benches. The success was mainly measured as an ability to give an output as close as possible from the input they received from their teachers.

There were some attempts to change things at different levels, with different purposes. My objective is not to give here a comprehensive view of all the movements that contribute to the changes in pedagogy, but just to quote one of them, though it was not in the higher education range.

There was an example in the French primary schools, called the "Freinet movement" from the name of its initiator, Celestin Freinet. The movement started in the first half of the twentieth century aimed at having pupils involved in what we would call now "authentic activities" instead of sitting on their chairs and listening to the teachers. The activity of the classroom was organized, by example, around the writing of a journal. They had to write and read, but also they had to go out in the country to find subjects about plants or animals. They had to read books of geography or

history to understand (and be able to tell) the geography and history of their own region or city. They had to apply mathematics to do the accountancy of the money necessary for purchasing supplies for the journal, and so forth. The activities were fully participative and the classroom space was organized around the activities. The teacher was a participant among others, acting merely as an enabler, helping the children to make their way among all the information, tools, and subjects that were at their disposal. The activities included enquiries, self-correcting files for the basics, participation in a classroom assembly, and exchanges with other schools. Though Freinet probably did not invent all these new aspects (some can be found in the work of Ovide Decroly, for example), the idea of putting everything together to radically change the philosophy of education is still inspiring a strong international movement ranging from elementary schools to adult education. It is interesting to notice the role played by technology (here the printing press) as a central actor of the classroom around which a lot of the activities and exchanges took place.

From Teaching to Learning

Shifting from teaching to learning is a revolution for the university similar to the one faced by industry when shifting from mass production of goods towards client relationship management. Even if I do not want to go further into the parallelism, what strikes me is the role that information technology is playing in both processes.

In the industry, computers were firstly introduced as automation tools, to do exactly what was done before, but quicker, cheaper, and safer. Then people began to understand (imagine) that they could use the technology to do things differently.

In education, the introduction of IT acted for many teachers and trainers as a revelator of the non-uniqueness of the pedagogical process. The question was not exactly to produce knowledge and to deliver it (even just in time, just on purpose, according to quality requirements, etc.) to students, but to understand that learners were co-producers in the process of knowledge building; that knowledge was something that every learner needed to build for herself in a "customized" way; that "knowledge building activities" were necessary; that one may learn from a lot of relations with professors, other learners, professionals, experiences, field situations, and so forth. And that computers and networks were embedded in these relations towards knowledge building in an active and complicated way.

Blending Actors' Roles in the Teaching-Learning Process

As a learner, I have different strategies that I can apply to learn something. These strategies mainly depend upon my resources (whether I am able or not to purchase these resources, such as a book, or a computer, or a seat at a university, or a TV set, or even a pencil and paper), and upon the purpose of my learning will. Do I want to learn to achieve a university degree, to be more culturally literate, to change my social condition by being able to have a better job or go somewhere else in the world, to better achieve my work, to get a promotion, to pass time in a more pleasant way? All these goals can be successive, at different periods of time, or can combine at given moments (I want to have a degree to be able to apply for a better job abroad). The next question is: What is the "best" way to implement my learning strategy? And what are the criteria that will build this "best" reference?

As a teacher, I must be aware that my students, even if they seem to be here with at least some common features (at this moment, their individual strategies share at least the evidence that it is interesting for them to enroll in this course, in this program, in this university), may be in the middle of different learning trajectories. Students coming from different contexts are split between different programs: experienced participants are enrolled in executive programs with specific formats, whereas young students are enrolled in initial programs; the time organization, requirements, controls, and so forth are different, and the different populations may or may not mix in classrooms.

As an IT specialist interested in working in a pedagogical team, I have different levels of perception of the interactions between technology and the learning-teaching process. I may be interested in experiencing new tools, new standards, new environments, in order to keep the course or the program "at the leading edge." I may be interested in inclusion perspectives: how to be sure that technology acts as a factor that allows a maximum of students acceding to contents, activities, discussions, group work, and so forth, including those with limited accessibility to usual classroom contexts. I may be interested in performance measurements: How can I measure the impact of technology on—to say it simply—the "success" of the participants, of the program, or the university? What are the indicators, what is the underlying model? How can technology improve things?

As a decision maker, being responsible, I am probably interested in the business aspects of things: What is the business model of this program? How can I attract more valuable students and "produce" more valuable people in the employment market? How can I promote innovation to compete for funding, increase my resources, attract renowned professors, researchers, and scholars?

And some other actors could probably be added to the list. Then we can see that one of the roles of technology might well be to enable, support, and facilitate the collegial work of all these actors in the learning-teaching process.

A very interesting model often used in innovation—and technology—management is the actor network theory (ANT). ANT comes from the work of two French sociologists, Michel Callon and Bruno Latour (see references in the Chapter 1). First thing in ANT is that an actor is not necessarily a human being; it might be any kind of artifact, technological or not, entities, concepts, organizations, documents, and so forth, and human beings. A network is the full set of relationships that link all these actors together. ANT is of specific interest when it comes to the introduction of novelties (e.g., new technologies, but also new values or a new state of mind). Another interesting topic is the idea of provisional stabilization (or "temporary truths"), meaning that the actors' network needs to agree on some stabilized knowledge to be able to go further. This idea might be helpful when dealing with areas where technology is not a stabilization factor in itself, because of its rapid change.

Learners' Strategies, Learners' Behavior, and the Assessment of Learning Situations

One of the most prominent questions for us, as well as many other kinds of workers, is to evaluate to what extent we are able to reach our working objectives. As actors of the learning process, whether it is as teachers, trainers, tutors, IT specialists, program managers, training managers, those responsible at institutions, or whatever kind of decision maker, we are more specifically interested in evidencing the value of different learning situations. Let us first consider what we mean by "learning situations."

As is now commonly agreed in a great part of the educational community, learning takes place in a network context. The learning network is built not only by the relationship between the actors of the learning process, but also by the relationship of these actors with different classes of actants, such as classical "tools" (books) or multimedia tools (computers, networks, mobile phones, TV, LMSs, LCMSs, CD-ROMs, software applications, hardware specialized devices, etc.); other less material objects such as models, frameworks, processes, and theories; and the assessment tools for all these actors/actants.

A learning situation can then be considered as an instantiation of the learning network within the context of a given set of learning objectives, a given pedagogical scenario including a given set of learning activities.

Previously, evaluation was often focused on the assessment of students' ability to reuse the knowledge (the content, the models, the frameworks, the rules, the recipes) that was delivered during the course. Concerns were about completeness, fairness, prevention of fraud and bias. In such a context, IT may appear as a large threat.

But, if we consider the learning situation as the place in which to embed the evaluation, then our perspective can change. If the learning situation insists upon autonomy,

responsiveness, and empowerment of actors, why not introduce an evaluation by the peers? If the learning situation takes into account the uncertainty of real-life situations and emphasizes the role of professional experts, why not introduce a collective evaluation both from the academic and field professionals? If the learning situation puts the stress on the ambiguous role of information technology in a case study, why not have a reflexive evaluation, by the learners, of the IT-based assessment?

The question of evaluation must be considered in coherence with the entirety of the learning situation, which includes the principles underlying the learning scenario (the learning philosophy) and the tools used to achieve the learning activities.

The Design of Learning Systems and Learning Environment

The design of learning systems has been and is still strongly impacted by the development of Web-based technologies, and more generally by the increasing embedding of information technology in pedagogy. Thus, designing a learning system is at the crossroads between system design (and especially innovative systems design), information systems design, and pedagogical design.

The locution "learning system" covers a broad range of elements, from the situation of a small group of students involved in one single learning activity for a couple of hours to the corporate integrated administrative and pedagogical system of a university.

Despite this diversity, a learning system might be characterized, as any other social system, very roughly, by:

- a border, which delineates the scope of the system;
- a purpose, an intention;
- a number of actors, more or less organized;
- a number of actions, grouped in a set of processes;
- a business model (this being taken in a very general sense of: resources employed vs. value created);
- a set of supportive means, including models, methods, theories, knowledge, know-hows, and tools; and
- an environment that enables and constraints the systems.

Designing a learning system is the job of multi-disciplinary teams, including, but not limited to, faculty members and, as often as possible, learners. The experience of other professionals in design, such as innovative product designers, IS designers, and new organization designers, might be of great help in designing learning

Figure 1. The diamond model for learning system design
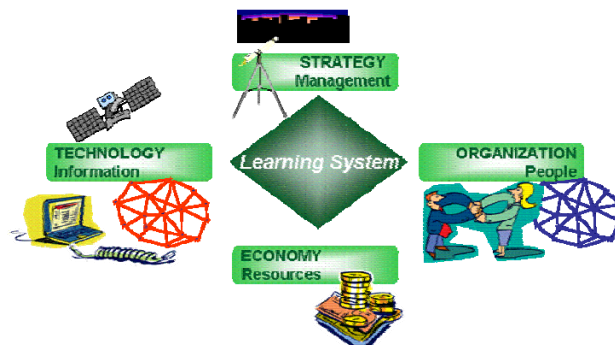
systems. In the same way, relying upon design models and methods, even if they were not designed for the pedagogical area, might help shorten the whole process time span and improve the efficiency of the system implemented.

As for any other information system design, four components must be taken into account: the objective of the learning system, the organizational context, the technology components, and the business model (see Figure 1).

Learning from corporate development projects can be of help when dealing with institution-wide projects of implementing learning systems. Including the librarians into the project organization, looking at systems architecture more in terms of standards and service than in terms of integration and locking, defining business indicators for success and performance, for example, should be considered as key steps of the project.

Lifelong Learning: One Learning Strategy Fits All Learning

Our world is one of increasing complexity, rapid change, and constant innovation. There is no more room for lifelong job positions in a single company. Professional trajectories cross a lot of boarders: companies, business sectors, jobs, countries, public/private, and so forth. Initial education is definitely not sufficient to guarantee lifelong employability. People must enhance, improve, diversify, and evaluate their knowledge and competences not only at key moments of their professional evolution, but on a permanent, continuous basis.

Naturally one does not learn the same way at different ages, in different contexts. Learning—taken as knowledge building—is a social situated process, anchored in practice and in communities.

Lifelong learning is the process through which people build their own identity within a network of communities, belongings, relations, activities. Teaching processes in the context of schools and universities used to be "academic," whereas continued education processes were more embedded in field activities. Now companies are more and more attracted by computer-based training processes, hoping that they will on one hand provide their employees with lower-cost training facilities, and on the other facilitate the training management processes for the company itself. But to really get the best from technology, the whole competency management process must be taken into account.

On the learners' side, knowing how to learn means learning how to continuously build a set of valuable competencies, whatever the job, business sector, or company may be. The responsibility of this process is more and more on the learner's side, companies being partners of the process, as well as universities and schools, and professional communities. Instead of propagating the traditional "academic" teaching in the professional area, the time has come to build a common culture of learning.

Bridging the Gap Between Academy, Industry, and Personal Life

Teachers—in a broad sense—are confronted with several mindset revolutions: from teaching to learning; from the idea that they were delivering the "good knowledge" to the recognition that they might "only" be the facilitators of a knowledge building process that implies themselves as part of complex network of actors and resources; from the belief of belonging to a "sanctuary" institution, cemented through centuries of tradition and certainties, to the evidence of being part of a "knowledge value chain" that anchors institutions in the worldwide global village and requires each and every actor to have the vision of the "big picture."

Collaboration between academics and industry is not only a question of finding case studies or internships for students; it is now the idea that competency building and competency management is a shared process between the individual, the business world, the academic world, and society.

There is no reason that the change process that deeply moves the learning-teaching area could be less impacted by information technology evolutions than the rest of the world. The increasing use of Web-based tools as mediators of the learning and competency acquiring processes, to take this single example, is fundamentally shaking the way things happen.

It is thus not surprising that current well-known situations such as users/IT suppliers' "potentially problematic" relationships are likely to happen. It is then extremely important that IT providers take their part in the learning network, and that learning

communities include IT experts as full members. Thanks to these close relationships, the learning community in the broad sense will benefit from the development of IT as well as the IT community will benefit from the change in education management.

Building a Community of Practice in E-Learning

The importance of communities of practice (CoPs) has now been evidenced and recognized by several authors on one hand, and on the other hand by practitioners whether it is in educational contexts or in companies.

Generally speaking, one could define a CoP as a network of people sharing a common practice, which makes a CoP a very particular kind of network. As quoted from Wenger—who is both one of the main founders of the actual concept of CoP and one of the most recognized authors in the area:

"Practice is what [people develop] to do their job and have a satisfying experience at work…The concept of practice connotes doing, but…in a historical and social context that gives structure and meaning to what we do.…Such a concept of practice includes both the explicit and the tacit…It includes the language, tools documents, images, symbols, well-defined roles, specific criteria, codified procedures, regulations and contracts, [but also] the implicit relations, tacit conventions, subtle cues, untold rules of thumb, recognizable intuitions, specific perceptions, well-tuned sensitivities, embodied understandings, underlying assumptions and shared world views. [Further,] *practice* [is the] *source of coherence of a community."* (Wenger, 1998, pp. 47, 49).

The "social production of meaning" within a community of practice is achieved trough three basic actions: "negotiation of meaning, participation and reification" (Wenger, 1998, p. 49):

- *"Negotiation of meaning characterizes the process by which we experience the world and our engagement in it as meaningful…it includes our social relations…often denotes reaching an agreement between people [and] suggests an accomplishment that requires sustained attention and readjustment."* (Wenger, 1998, p. 53)

- *"Participation…suggests both action and connection. [It] describes the social experience of living in the world in terms of membership in social communities and active involvement in social enterprises."* (Wenger, 1998, p. 55)

- *"Reification shapes our experiences. [It] covers a wide range of processes that include making, designing, representing, naming, encoding and describing,*

as well as perceiving, interpreting, using, reusing, decoding and recasting." (Wenger, 1998, p. 59)

We all agree to say that learning is a complex multidimensional process. There have been and are still several schools of thought attempting to describe, explain, and represent what learning is. The discussion is always animated between all these schools of thought, even though the "constructivist + collaborative" lead seems to be one of the most popular at the moment.

It is not the purpose here to discuss what differentiates all these representations, but instead to try to build upon a few key elements that could be cornerstones of our CoP: actors, activities, situations, and places.

Actors

The number and types of actors involved in the learning process has increased significantly since the traditional picture of a master reading a book in the classroom and students writing religiously the master's words in their exercise books. The pedagogical team is now multidisciplinary, including different species of teachers and pedagogical supporting people—trainers, tutors, coaches, experts in pedagogy, psychologists, librarians, pedagogical designers, staff members; experts of the content—theories, data, representations, models, methodologies; experts of the technologies used—supports, display, transmission, broadcasting, simulations, software of any kind; and learning managers—responsible for programs, institutions, accreditation committees, and so forth. Even the learners are now—and fortunately—considered to be actors of the learning process. And more and more often, representatives of professional communities are integrated as key elements of the learning community; either via the integration of internships or conferences in the curriculum for students in their initial education, or even via the integration of students within professional communities of practice, or, better, the embedding of practice and learning in the professional activities as in lifelong learning. Regarding the "actants" side (Latour 1987)—that is, the unanimated actors involved in the process—their nature and complexity has also dramatically increased, especially with the introduction of technologically advanced objects like computers, networks, and software applications and environments.

Activities

The time has passed when listening to the professor and taking notes in an exercise book were considered the key activities of learning and knowledge delivering the key activity of teaching. Teachers (in all their variety as listed above) are now commonly considered as facilitators in the social process of knowledge building within

the learning community. Activities of the learning process are as diverse as reading a book, surfing the Web, attending a videoconference lecture, interacting in virtual groups, dialoguing with field experts, supporting mutually between students to achieve work, creating artifacts, doing presentations in the classroom, enriching the course textbook with quality reports and findings, sharing experience at work and producing valuable models and representations of it, formalizing work experience and classroom knowledge within frameworks of competences, and even, from time to time, listening to a professor.

As educators we face then a difficult question, which is the one of evaluation and assessment. If learning activities are so rich, diverse, and deeply interactive, how can we evaluate the "amount of learning" that every participant in the learning process has acquired? And if learning is so embedded in social practices, how can we evaluate the performance of our programs and courses? We probably will have to take into account competence management models that will enable us, our students, and their possible employers to better share common views.

Situations

Situations of learning include both the context and the scenario of the learning activities. The context is increasingly diverse and changing. From university classrooms to company offices, from initial training to vocational training to continuing education to lifelong learning, from paper stuff to the World Wide Web, from local education to the global learning field, the environment within which we learn is reflecting the increasing complexity of the surrounding world in itself. If we want to offer to learners the most valuable learning situations, we now have to think about building learning scenarios that take all the richness and diversity of the environment into account. Learners will experience the real business or professional world, discuss and negotiate the meaning of the information available, produce presentations of professional quality, solve real-life problems, make thoughtful dissertations, cross-assess their work, confront with practitioners, create artifacts and models, and reflect upon their individual and collective learning process.

Places

When complexity increases, we have an increasing need of landmarks. The world is becoming a small village, and at the same time we are more and more looking for our "roots," our "hometown," our "family home," our "tribe," whether it be real or virtual ones. As the classroom is extending to the World Wide Web, as the local university is offering semesters abroad, as the university is opening its doors and both sending students in companies and welcoming people from companies in its walls, as students are themselves becoming more global, traveling from country

Figure 2. Components of a social theory of learning (Wenger, 1998, p. 5)
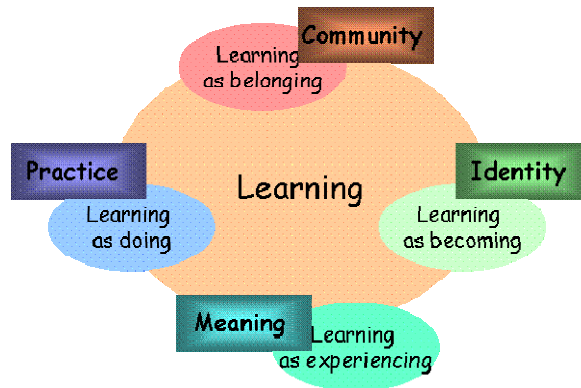
to country, from internship to virtual classes, it seems more and more necessary to help learners be able to situate themselves in time, space, and activities. Being able to build a common place for learners is now also the responsibility of course and program designers: a graphic charter, a common vocabulary, a better knowledge of the learning community (even though very volatile), a way to exchange and share beyond class content, to better know each other, to socialize.

The learning-teaching community is experiencing new situations almost on a daily basis. Our colleagues are coming from very different backgrounds, countries, cultures, and age. Some are in the "standard" educational career, some have already been working in companies, some are most of the time on campus, some come from time to time and some never. Some are involved in more "vertical" tracks, trying to acquire as much expertise in a field as they can; others have already experienced different career paths and are redirecting their participation trying to take into account the evolution of the job marketplace. The same occurs for our students and participants.

In regard of our teaching activities (though "teaching" could seem like being out of fashion at the moment), we are less and less able to design, implement, deliver, tutor, and assess our class by ourselves. We have to work in multidisciplinary teams, and coordinate experts, professionals, technical experts to help us with information technology, and pedagogical experts to support us in the design of our pedagogical scenarios. We need to acquire multi-dimensional competences, not forgetting our ability to be expert in our "content" field by proving our capacities in doing research and writing papers.

We have to cope with the increasing complexity of teaching situations. If we want to stay competitive, like any good professional in the world, we have to learn, and

learn quickly. Coming back to Wenger, we might be willing to consider his social theory of learning (see Figure 2).

Belonging to the a community of practice helps us enhance the quality of our practice and perform better in our professional environment, by sharing experience, building knowledge, and creating new meaning in our professional life.

This book aims at providing the first elements in the process of building such a community of practice in e-learning.

Content of the Book

Section I: Rethinking the Learning Process explores the changes that occur in learning situations when using new technological supports, tools, or environments.

Chapter I, Education Accountability via Actor-Networks by Xueguang Ma and Roy Rada, presents an application of ANT to the development of a new, Web-based education accountability system. Part of their conclusion is: *"The collaborative modeling and system development processes shaped social practices in the teacher education program…Education is an intrinsically social phenomenon. Technology is intrinsically vital in supporting education. The challenge of successfully implementing social and technical change requires the support of organizational theories such as ANT."*

Chapter II, E-Learning and New Teaching Scenarios: The Mediation of Technology Between Methodologies and Teaching Objectives by Cecilia Mari, Sara Genone, and Luca Mari, evaluates the coherence between the learning objectives, the design methodology, the attitudes of different actors, and the choice of technical tools, within the context of a broad e-learning program at Cattaneo University, Italy.

Chapter III, Using Web-Based Technologies for Transformative Hybrid Distance Education by Nory B. Jones and Gloria Vollmers, relates experience and lessons learned when working with entrepreneurs and trying to meet their needs through complex Web-based technologies and distance collaboration. The authors explore a lifelong learning situation blending virtual classrooms and a virtual team with a real-life community of practice in entrepreneurship in order to design an entrepreneurship portal, which will in the future support knowledge capitalization and training activities for the entrepreneurs in the community. Critical success factors are quoted as *"a cohesive group culture…a shared vision, and the desire to attain a common goal. The mix of personalities and expertise also contributed to a positive group dynamics and the motivation to produce a quality deliverable…because the final product represented an important contribution to the state."*

Chapter IV, Web-Based Interface Elements in Team Interaction and Learning: Theoretical and Empirical Analysis by Klarissa Ting-Ting Chang, John Lim and Yingqin Zhong, states that the learning process might be significantly enhanced if the user interface of the learning system is carefully designed. The authors present a theoretical model which links interface elements, interaction process characteristics, social and technical attitudes, and learning outcomes. They evidence the fact that "*the availability of interface elements to engage and evaluate…affects group interactions, which has consequences on attitudes and learning outcomes.…Technological tools for capturing, retrieving and disseminating information have been commonly used in corporate organizations in the form of knowledge management. In a learning environment, understanding how learners create and transfer knowledge would be valuable in implying causal relationship between interaction and outcomes.*"

Section II: Understanding Learners' Behavior and Developing Active Methods and Interactivity in Web-Based Courses puts the stress upon the relationship between the technology and the learners' behavior in the search for performance of the learning process through enhancement of activity, pro-activity, and interactivity.

Chapter V, A Hybrid Method for the Analysis of Learner Behavior in Active Learning Environments by Claus Pahl, presents behavior analysis techniques for Web-mediated learning, in order to better understand the student learning process in learner-controlled interactive environments. The chapter analyzes four aspects: motivation, acceptance, organization, and usage, both through surveys and Web-mining techniques. It states that, when "*motivation…is the acquisition of skills…and skills development, recognition, and memorization,…active learning provides the necessary type of interaction…The right level of interaction must be designed and supported…Active self-controlled learning is an effective approach…However, using this technology, students are required to change their learning strategies.*"

Chapter VI, Improving Teaching Effectiveness Using Distance Education Tools by Murali S. Shanker and Michael Y. Hu, intends to develop and illustrate a framework linking student performance and satisfaction to the learning environment and course delivery, and then to evaluate it in a course that is both delivered in a traditional classroom and at a distance. The authors evidence that "*most studies…compare classroom and Web-based learning in terms of their effectiveness…Performance outcomes are mostly a function of the learning environment and course design…Recent results also indicate that Web-based education may not benefit all students and that student personality traits have a significant impact on achievements.*"

Chapter VII, Instructional Interactivity in a Web-Based Learning Community by Adams Bodomo, introduces the novel notion of conversational learning community in the design and implementation of Web-based courses, together with a practical model of implementation of such a community. It concludes that "*Society seems to require…to produce graduates who are creative thinkers and problem solvers…literate enough to function well in a knowledge-based economy where there is*

a pervasive use of ICT. To achieve this educational goal, we need to…move away from passive methods of teaching to more active and interactive methods." Designing learning systems and learning environments might be seen (or even feared) as a totally new process that must be invented from A to Z.

Chapter VIII, Online Behavior Modeling: An Effective and Affordable Software Training Method by Charlie C. Chen, Terry Ryan, and Lorne Olfman, argues that well-known and effective training methods, such as behavior modeling, can be usefully transferred to online learning. Furthermore they conclude that *"online behavior modeling is more cost effective than face-to-face behavior modeling,"* at least in the area of software training.

Section III: Designing Learning Management Systems for Value, Sustainability, and Accessibility presents different aspects of designing and evaluating a technology-supported learning environment for better efficiency of the systems, as well as at the learner level, institutional level, and technical level.

Chapter IX, Evaluating Learning Management Systems: Leveraging Experiences Learned from Interactive Multimedia by Katia Passerini, presents an approach for evaluating Web-based multimedia learning environments (LMSs, or learning management systems) as a full actant of the learning network. The evaluation process takes into account both the built-in ("objective") qualities of the tools and the interaction process through the learning network. This approach is applied to a given LMS, the Prometheus environment at George Washington University.

Chapter X, A Field Study on the Role of Assistive Learning Technologies by Claire Khek, John Lim, and Yingqin Zhong, presents the situation when some of the actors of the learning network—here mainly learners—have special needs due to different disabilities. Better integration of these learners in the general mainstream learning activities has to be thought at the scenario design level. The use of assistive technology is analyzed in coherence with the desire of students to improve their social competency. The authors also stress the need for enhanced technologies that could be tuned to better fit the individual needs of the students. ITC, though seemingly various and complex, still does not provide enough specialized devices or applications.

Chapter XI, Asynchronous Learning: Emerging Issues for the 21st Century by Anil Aggarwal, Murray Turoff, Ronald Legon, Gary Hackbarth, and Danielle Fowler, is an attempt to produce a temporary stabilization (in the sense of ANT) regarding asynchronous learning, by building upon the shared experience of several faculty members with several years of e-teaching experience. They discuss a variety of issues—volume, quality, economies of scale, strategic partnerships, hybridization of courses and programs, information and resource overload, changing nature of faculty jobs, assessment, competition, turbulent software environment, emergence of m-technologies. Understanding that *"we are entering a completely free and open marketplace for higher education, where the student becomes a true consumer, who*

can choose among a wide range of alternatives institutions for the same degree program without ever leaving home," they argue that *"those who want to produce quality and successful systems for education…need to focus on the efficiency and design systems that easily integrate with each other; [they] should not be caught in dependencies on any one system and in inability to move to better systems."*

Chapter XII, Reshaping the Structure of Learning Objects in the Light of Metacognition by Salvatore Valenti, Carla Falsetti, Sulmana Ramazzotti, and Tommaso Leo, presents a new model that explicitly introduces the representation of the learning design, expressed in terms of metacognitive framework and of navigational aids. The model defined represents a superset of the IEEE specification (as discussed in IEEE-LOM, 2002), is compliant to the specification provided by Brennan et al. (2001), and constitutes a variant of the IMS-LDIM (2003).

Section IV: Lifelong Learning: Bridging the Gap Between Academy and Industry is an attempt to include views from different perspectives—for example, the point of view of players in IT development, of professionals of training in companies and of institutions looking at themselves with corporate concerns.

Chapter XIII, In the Future: Learning Will Reshape our World at Work, at Home, and at School by Richard Straub, summarizes the reflections of the director of IBM Learning Solutions for Europe, Middle-East, and Africa (EMEA) upon the fact that: *"In a business environment that is constantly growing and changing due to new innovations, advanced technology, and market conditions, organizations must find new ways to enable rapid responses to the needs of their customers and the marketplace. This means having an adequately educated workforce that will not only respond to evolving issues, but even foresee upcoming trends and proactively pursue these arising challenges…Companies committed to transforming into a learning organization must evaluate change in five dimensions: governance and management, design and delivery, technology, organizational alignment, and culture. Evaluating these five dimensions of change prepares a company for the future of learning."*

Chapter XIV, Opportunities for Open Source E-Learning by Fanuel Dewever, presents the market opportunities for open source software in the e-learning field. It is written by a researcher at IBM Belgium who has been involved in several European projects in e-learning. It is also a testimony of the multiple engagements of large companies like IBM—it is true not only for them, naturally—in the various threads of innovation, including the pedagogical ones.

Chapter XV, Academy-Industry Collaboration: The Example of Bridge eLearning by Dany Lessard and Jacques Gaumond, presents an example of collaboration between companies and academic bodies in an attempt to build a community of practice linking academic and practitioners in the e-learning job. The idea is to create a consortium of partners to develop and share knowledge about e-learning, and also to develop content and support for new learning materials. After a little

more than one year of existence, Bridge eLearning was able to derive its grounding principles, validate its business model, issue the first contents, and provide the community members with improvement in their e-learning knowledge and practice. This chapter is an example of a possible business model to help break the barriers between academic bodies and companies, and bridge the gap between initial education and lifelong learning, not only regarding the public or the content of the trainings, but really at the level of learning system design.

Chapter XVI, Strategic Design for Web-Based Teaching and Learning: Making a Corporate Technology System Work for the Learning Organization by Brian Corbitt, Dale Holt, and Stephen Seagrave, presents the process of integrating online and on-campus education within a single university. The authors argue that only strategic design *"can create and sustain enduring teaching and learning value, supported by corporate technology,"* based on *"vision, leadership, trust, encouragement, reward, appropriate forms of staff recognition and development, facilitative structure, and continuity of action."* This prevents the process from being too much *"product centered"* while integrating and fostering *"new forms of academic collegiality."* It enables integrating the core values of the university in the "digital enterprise." Strategic design, again, is not something new, but its application to a corporate-wide learning system design proves to be *"the best way forward in exploiting the potential of the corporate technologies for the enduring benefit of all parties with a stake in educating the organization's learners."*

Chapter XVII, Web-Based Education Diffusion: A Case Study by Anil Aggarwal and Ronald Legon, reflects upon the position of institutions that *"survival may depend on how successfully they can adopt Web-based education (WBE). In this regard they can learn from the early adopters of WBE, and from their experiences both good and bad without reinventing the wheel."* The authors adopt a business approach and view Web education as a *"product"* investment. They state that *"It is important that the product must be customer oriented. It should be of high quality, differentiable from its competition, packaged attractively, and have value 'added' to it…It is no secret that many universities are losing money on their Web programs…The promotion of WBE can take many forms like Web advertising, public relations, word of mouth, and unsolicited publicity."* The authors illustrate their model with the case of the University of Baltimore, a mid-sized public urban institution.

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