Online and Distance Learning:
Concepts, Methodologies, Tools, and Applications

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Chapter 2.22
Fast Prototyping as a Communication Catalyst for E-Learning Design

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ABSTRACT

This chapter proposes a renewed perspective on a known project management model, fast prototyping, which was adapted for the specific issues of e-learning development. Based on extensive experience with large e-learning projects, we argue that this model has a positive impact on e-learning project team communication, and that it provides a good basis for effective management of the design and development process, with specific stress on human-factor management. The chapter stems from the experience gained at the eLab (e-learning laboratory— www.elearninglab.org), a lab run jointly by the Università della Svizzera italiana (USI —University of Lugano) and the Scuola Universitaria Professionale della Svizzera Italiana (SUPSI—University of Applied Sciences of Southern Switzerland) in Switzerland. It contains three case studies of different applications of the fast prototyping model and has a strongly practical focus.

INTRODUCTION: SOME ISSUES IN LARGE E-LEARNING PROJECTS

The transition to e-learning in higher education institutions, at course, program, or institutional level, always requires a radical change in the organization. This means that instructors, teaching assistants, and subject matter experts are faced with a new situation in which many of the assumptions on which they previously relied are brought into discussion. Moreover, they need to work in teams with other professionals—graphic designers, Web programmers, instructional designers, etc.—who might not share their professional language and understanding of the topic and of teaching and learning as such (Botturi, 2006). In many cases, the team members are novices in the field of e-learning and do not have sound design practices or established routines for their tasks; consequently, the team cannot rely on common ground for mutual understanding (Clark, 1996).

From the point of view of the teaching staff, we should consider at least two main layers: (a) knowledge/skills and (b) the attitudes required to implement effective and efficient e-learning experiences. In the first layer, the main issues are concerned with a radical change in the teaching development context, moving from a craftsmanship model—the teacher looking after the whole teaching process, from conception to delivery, from materials development to evaluation—to an industrial model, where many different people, with different professional backgrounds, are to collaborate in order to design and implement the e-learning experience (Bates & Poole, 2003). In the second layer, an instance of the well-known process of diffusion of innovation is found: People fear innovation and resist it unless positive conditions occur (Rogers, 1995).

The design model, which embodies the overall approach to e-learning, plays a key role in tackling these issues. This chapter addresses them in the context of large e-learning projects where a fast prototyping model has been adopted, stressing two areas of intervention in the two layers.

1. The first area is collaboration in working groups, where people with different backgrounds and expectations are to collaborate in order to develop e-learning applications. In fact, the design, development, and delivery of an e-learning course or program is a team activity that requires a high level of coordination and cooperation, as well as integration in the organization's culture (Engwall, 2003). The people who take part in the process should feel at ease if they are to express real commitment to the project and establish trust in each other. This is particularly true for teachers and instructors who play the key role in an online course, as they are mainly responsible for content production and course delivery.
2. In the second layer, fast prototyping provides e-learning projects with the attribute of *trialability*, so important in fostering the adoption of innovations. Trainers not accustomed to the e-learning field are offered a concrete experience of what courseware could be; this, in turn, helps them leave aside prejudices and negative attitudes.

The following section will provide some background about the management of e-learning projects and the institutional context of the Swiss Virtual Campus (SVC), from which our case studies are drawn. We will then introduce some reference to the design models from instructional design (ID) research and then move on to present the eLab fast prototyping model, which will be described and discussed through three case studies.

BACKGROUND

Institutional Context

This chapter mainly focuses on the introduction of information and communication technologies in traditional campus-based universities; namely, we will deal with the projects promoted by the Swiss Virtual Campus (SVC, www.virtualcampus.ch) program to introduce e-learning in Swiss higher education institutions (Lepori & Succi, 2003). The SVC program understands *e-learning* as defined by the Commission of the European Community: "the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration" (CEC, 2001). This definition includes all e-learning models that could be situated on the continuum between fully face-to-face teaching and fully distance education through the Internet (Bates, 1999).

SVC projects bring together a network of higher education institutions for the development of shared e-learning resources. Project team members usually speak different languages and have a different background and education; moreover, for most of them, it is their first experience in e-learning. These situations are characterized by the lack of established routines and of common ground, so that developing a shared understanding and setting clear goals is often an issue.

There is a growing body of literature concerning the adoption of e-learning in European universities showing a consistent pattern (e.g., Collis & Van der Wende, 2002; Lepori & Succi, 2004; Van der Wende & van der Ven, 2003). In most cases e-learning is introduced in a very decentralized way and as an instrument to improve existing face-to-face activities rather than to radically transform them (Collis & Van der Wende, 2002); moreover, only in some cases does the introduction of technologies lead to the creation of new educational offerings and of specialized subunits—e-learning is generally embedded into the existing curricula and departments (Lepori, Cantoni, & Succi, 2003).

There are some features here that are not easily compatible with conventional ID models and practice, especially in e-learning (Lepori & Perret, 2004):

1. E-learning is rarely implemented as standalone, online courses, but more often as units within existing face-to-face activities; this requires considerable integration of course production and delivery.
2. E-learning is embedded in a context where competencies and attitudes toward technology are very diverse, ranging from early adopters to a significant share of innovation-averse people (Rogers, 1995; Surry & Farquhar, 1997); thus, we cannot assume from the beginning that all people involved in a project have sufficient competencies in educational technologies, nor that they share the same vision concerning their adoption and usefulness. Communication and sharing views is thus a central issue.
3. The academic culture traditionally attributes a central role to the professor, not only in deciding the main guidelines for course content, but also in managing and fine-tuning it during the delivery. A work division between the production of contents (by experts of the subject), their technical implementation, and their delivery (possibly with tutoring) is not compatible with this culture. It is thus necessary to involve professors in all development phases, but this makes project management more difficult, since academic hierarchies interfere with it.
4. University education is far from being homogeneous in aspects like the level of standardization of contents, the type of delivery, the level of students, etc. Thus, each e-learning application has to be tuned to its specific context.

Projects in the first phase of the SVC program, launched in 1999, were seriously beset by these issues. The SVC financed the development of online courses aimed at university students and produced by large consortia of Swiss universities. The underlying logic was to gather the contributions of different professors on the same subjects to produce high-quality courses to be used throughout Switzerland, thus achieving economies of scale. An accompanying study showed that this model—largely inspired by the production of online courses in distance universities—was in most cases at odds with higher education and academic culture (Lepori & Perret, 2004). As a result, development was delayed, most projects did not complete all the units foreseen, and a lot of energy was spent in experimenting and in discussing technical issues. The average cost per project was very high (for a single university course the costs in many cases exceeded US $1 million). Also, project management proved to be difficult because of the size of the projects and academic conflicts, while project coordinators were mostly relegated to an executive role. We could say that the failure of the model proposed by the SVC led most projects to go back to more traditional academic models, well-suited for research but not for e-learning course development.

During the preparation of the second phase of the SVC (CUS, 2002), the eLab, the e-learning support centre of the Università della Svizzera italiana (USI – University of Lugano) and of the Scuola Universitaria Professionale della Svizzera Italiana (SUPSI – University of Applied Sciences of Southern Switzerland) developed a critical reflection on possible development models for e-learning courses in traditional universities. Management science has proved that the best management model for a project depends to a large extent on two elements: (a) the kind of application to be developed and (b) the specific institutional context, considering not only organizational issues and resources, but also the organizational culture and the relationship with institutional strategies (Engwall, 2003). The SVC experience thus far and an extensive body of empirical research (Lepori & Rezzonico, 2003; Lepori & Succi, 2003) showed that most classic ID models rely on assumptions which are, to a large extent, incompatible with the mainstream academic culture in traditional campus-based universities, and in many cases the success of e-learning projects was hindered by these incompatibilities.

Our effort therefore concentrated on developing a different approach: The goal was to provide simple guidelines that could fit into the existing cultural frameworks and enhance communication in our teams. This model was included in the e-learning management manual (Lepori, Cantoni, & Rezzonico, 2005), which was distributed to all new SVC projects started in summer 2004.

In order to set the context for the presentation of the model, the next section will introduce some current ID models and clarify some of their assumptions in relation to the context of SVC projects and of the introduction of e-learning in traditional higher education institutions.

ID Models and Their Assumptions

The tradition of ID has collected a huge number of models that guide the design and development processes of instructional units (Andrews & Godson, 1995). Each model emphasizes a peculiar aspect of the process, striving to achieve prescriptive value without overlooking the eclectic (and often hectic) reality of practice.

Classic ID models, starting from ADDIE up to ASSURE (Heinich, Molenda & Russel, 1993) and the Dick, Carey, and Carey model (2001, see Figure 1), take a linear perspective: they describe the ID process as a structured and orderly step-by-step activity, characterized by a progressive advancement through analysis, design, development, implementation, and evaluation; the process also includes a cycle of revision for each edition or delivery of the training.

Such models, which have behaviorist roots and were mainly developed in the military context, still represent the foundations of ID as a discipline and have provided inspiration for many projects. They offer clear guidance, emphasize the intrinsic logic of design, and rely on two main assumptions:

1. **The assumption of quality information:** The designer can work on complete information (from the analysis phase), and the designer can rely on the fact that the instructional context is stable (i.e., there are no unforeseen events).
2. **The assumption of expertise:** The designer can master the process and will not make errors, and all the team members and stakeholders will give their contributions as required, at the right moment and in a clear and unambiguous manner.

In the history of ID, a specific emphasis in the education of instructional designers was derived from the second assumption—it was more process-oriented and tool-oriented than communication-oriented.

Experience such as that presented in the analysis of SVC projects has shown that these assumptions do not always hold in the academic setting. Often stakeholders, professors, and instructors cannot express precise requirements, and it can happen that the analysis overlooks some relevant details; also the actors in the ID process may make errors. These are exactly the pitfalls that we identified for e-learning design, a setting in which technologies bring more complexity and uncertainty.

More recent works in ID have proposed a heuristic approach—less prescriptive and more practice-oriented. Morrison, Ross, and Kemp (2003, see Figure 2) proposed a model that includes all the *steps* proposed by Dick, Carey, and Carey (2001) as *elements* in a progressive discovery model: "The elements are not connected with lines or arrows. Connections could indicate a

Figure 1. The Dick, Carey, and Carey model (Adapted from Dick, Carey, & Carey, 2001)

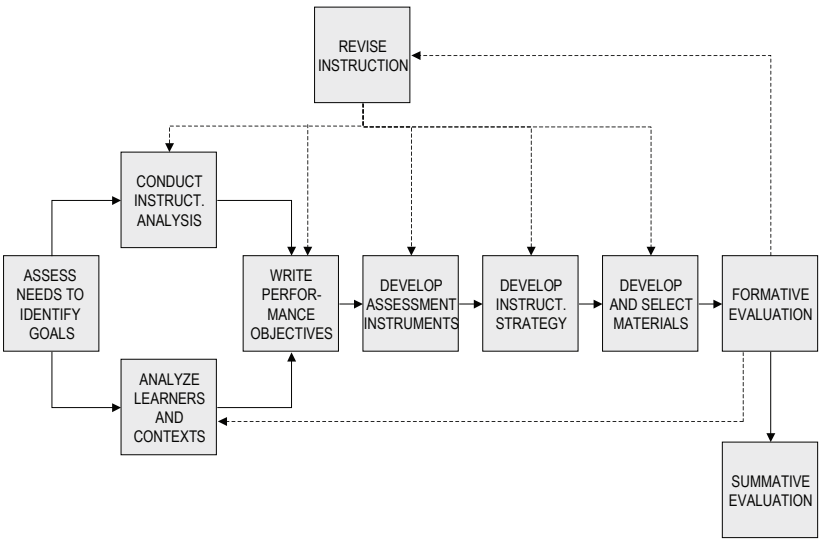
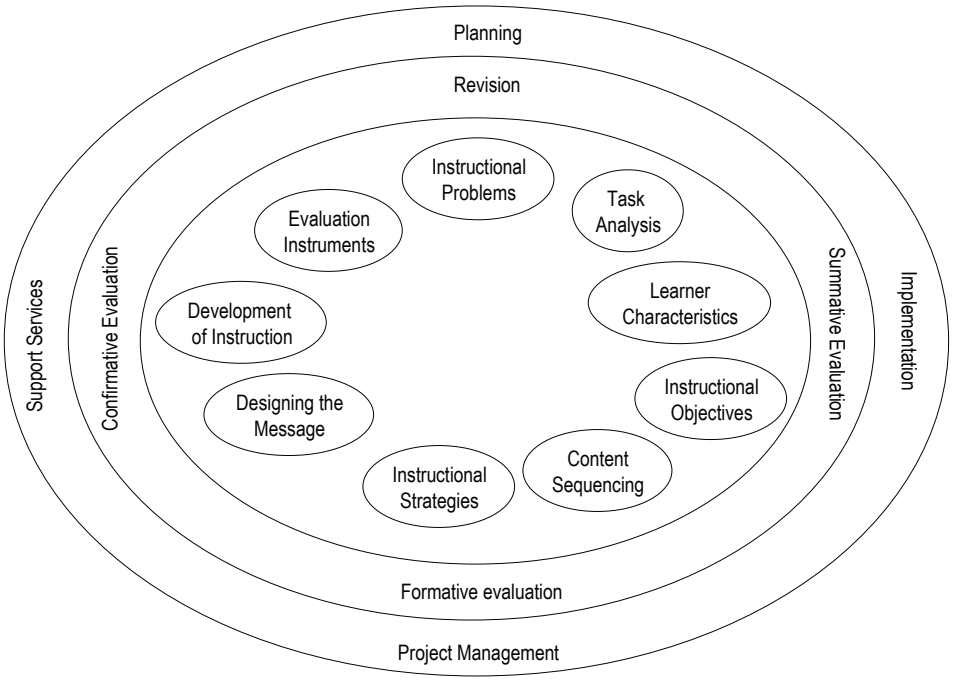


Figure 2. The oval model (Taken from Morrison, Ross, & Kemp, 2003)



sequence, linear order. The intent is to convey flexibility, yet some order in the way the nine elements may be used. Also some instances may not require treating all nine elements" (p. 8). The designer will decide which ones are relevant and which do not require particular consideration. This provides play for adapting to new technological situations in the e-learning domain.

The assumption behind this model is that the designer has strong meta-cognitive skills: She or he can shape and re-shape the process according to the situation. From a relational point of view, the designer also needs strong leadership skills, as he or she has to steer the design and development process with a good deal of improvisation, without relying on the solid guidance provided by linear models.

The R2D2 model (Willis, 1995) takes a similar perspective, borrowing a strong emphasis on communication and negotiation from constructivism and placing itself at the opposite ideal end of linear models. R2D2 has four overarching principles:

1. **Recursion:** The steps/elements are revisited at different times, and decisions can be made anew, shaping a spiral-like flow.
2. **Reflection:** Is contrasted with the linear design rationality of linear models: According to Willis (Colón, Taylor, & Willis, 2000) "(r)eflective design places less faith in preset rules and instead emphasizes the need… to thoughtfully seek and consider feedback and ideas from many sources."
3. **Non-linearity:** R2D2 does not present a set of steps, but rather one of focal points, close to the idea of elements in Morrison, Ross, and Kemp (2003, see previous).
4. **Participatory design:** The whole idea behind this model is that the ID process is not only the designer's job, but rather team

work, in which different people collaborate. Communication and negotiation acquire a primary role here.

The drawback of this model is that much is left to interaction, and very little guidance is provided for complex or problematic situations. Namely, when few recognized common practices exist, the discussion may expand without converging. On the other hand, R2D2 and other constructivist models are focused on the fact that instruction lives in a specific context, and its conception, design, and development should be strongly rooted in it. The community dimension is here taken as the focal point, and the model aims at providing a controlled space for discussion, maximizing sharing and mutual understanding in the design team, helping it develop a common background, and hence enabling it to become—at least to a certain extent—a community of practice (Cantoni & Piccini, 2004; Wenger, 1998; Wenger, McDermott, & Snyder, 2002).

The eLab fast prototyping model tries to merge the three perspectives (linear, heuristic, and constructivist) by providing a method organized into brief steps for the development of a "physical" focus of discussion—namely, a prototype. Its major aim is to have a development model soft enough to adapt to each project, but at the same time sufficiently structured to keep development time and costs reasonable. This was necessary also because the budget of the second series of SVC projects was significantly reduced.

FAST PROTOTYPING: THE eLab MODEL

The Model

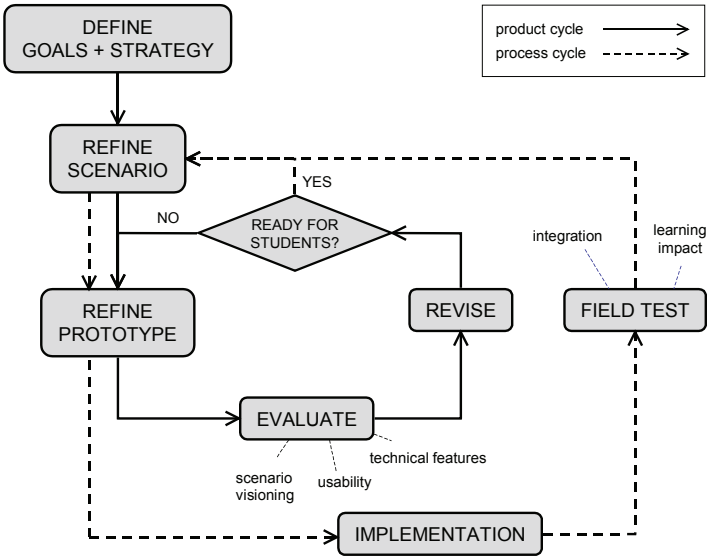
The eLab chose to tackle these issues in e-learning projects in higher education with a well-shaped and sound prototype-based design and development model. The originality of the approach lies in considering fast prototyping as a communication catalyst: The main advantage of a fast prototyping model is to enhance discussion in the team in a focused way by concentrating on facts and results and not on theories or prejudices about learning technologies. Enhanced and focused communication fosters the development of mutual understanding among the different professionals involved in the project and the creation of trust—two important conditions for a successful development. The goals for which the eLab model was developed are:

1. To make the design and development process flexible with respect to ideas emerging from the progressive understanding of the project among team members, by providing moments in which new inputs can be taken into account.
2. To make the design and development process adaptable to new needs emerging from tests and results, given that the use scenario is varied (multiple institutions), partly undefined (e.g., changes in curricula because of higher education reforms), and not available in detail at the outset of the project.
3. To allow teachers, instructors, and subject matter experts to focus on the teaching and learning activities and not on the technologies themselves, fostering trialability.
4. To enhance communication with external partners.

The adapted fast prototyping model for e-learning is structured in two cycles: (a) the inner or *product cycle* and (b) the outer or *process cycle* (Figure 3).

The design and development process starts with the identification of high-level learning goals and of a specific strategy (e.g., teaching level B1 English with a game-based strategy or teaching the basics about color perception with a case-based approach). This is a team effort, often accomplished in writing the project proposal.

Figure 3. eLab adapted fast prototyping model



These elements are embedded in a scenario, a narrative and semi-formal description of the instruction, which sets some parameters, namely target students, communication flow and support, organization of the schedule in terms of time allocation and as a blend of face-to-face and distance learning activities, and the use of multimedia and interactive technologies. The scenario is therefore an informal definition of the instructional and technical requirements for the project. It is paramount that the scenario is agreed upon by all team members, as it serves as leverage for the evaluation and revision of the prototype. The development of a shared scenario, guided by the instructional designer, is in itself an important activity for the project: By discussing the project in concrete terms team members are able to see the final product through students' eyes.

The product cycle. The scenario is the starting point for the product cycle, which starts with prototype development and is aimed at developing a product that fits the scenario. By *prototype* we mean structured courseware, with real content, already implemented as if it were to be used in a real setting. A prototype often includes only a part of the content, or leaves out some features, but the main point is that it is actually usable in the related scenario.

The project team then internally evaluates the prototype in two ways:

1. The eLab staff evaluates it with standard procedures that assess its technical features and usability and produces a list of improvements that are proposed to the team.
2. Other non-technical team members try out the prototype's fit to the scenario description in a focus group in which they envision its use in the scenario they developed.

This double revision process provides full-spectrum feedback and makes project members move one step further in the development of a shared understanding. While developing the scenario they merely described a wish-situation; now, the prototype has them evaluate single features (e.g., navigation structures, exercise feedback, etc.) and make decisions. Moreover,

this discussion helps the designers gain insight into the non-technical partners' understanding of the training.

After the evaluation, the prototype is consequently revised, and a decision is made as to whether it is ready for real testing. If it is not, another product cycle is performed, starting from a refinement of the scenario according to the new possibilities explored during evaluation; if it is, the process moves onto the process cycle. When this occurs greatly depends on the single project, as discussed in the following case studies.

The process cycle. The process cycle is basically a field test. Its first step is the refinement of the scenario (a virtual description) into the description of an actual use setting: one single institution, a specific group of students, in what type of technical facilities, etc. The prototype is accordingly revised and adapted and then implemented and integrated into the course. The testing is constantly monitored, and the final evaluation of the process cycle happens in three steps: (a) with a standard questionnaire delivered to the students, which measures Kirkpatrick Levels 1-3 (satisfaction, learning, transfer; cf. Kirkpatrick, 1998); (b) through analyzing the performance of students in the course exam or assessment; and (c) with a focus group that collects feedback from the instructors.

The evaluation provides new input for the project team, which can decide to make revisions and perform another test, to conclude the implementation and produce the final courseware, or if the real situation has proved very different from the scenario, to even switch back for another product cycle.

The following case studies show the impact of this model in three SVC projects supported by the eLab. Case studies will be analyzed with respect to the type of e-learning application development, the subject matter, the institutional partners and team members, the budget, and the expected results.

EAD: Ecology in Architectural Design

The goal of this project was to develop a blended learning course on the integration of ecological issues into architectural design, both at the level of buildings and of human landscape. The project leader was the Accademia di Architettura of the USI (Academy of Architecture). The project started in July 2004 and immediately adopted a fast prototyping model. At the beginning of September 2004, the first prototype module (*Building—Climate*) had already been developed by the project leaders. Moving from the product to the process cycle, the module was then tested with more than 100 USI bachelor students in the winter semester 2004 (October 2004-February 2005). At the same time as the test phase, the module was evaluated and discussed by all other project partners.

In the case of EAD, the rapid development of the prototype module aimed to rapidly create a concrete basis for communications about the course, thus avoiding long and useless discussions focused only on abstract ideas about e-learning. By being shown an example of how the modules could be designed and could appear, all the people involved in the project, even those who were not experts in e-learning, could get a concrete idea of the course. In fact interesting discussions soon arose among project partners, in particular about the issues of information design and of graphics and layout. The emergence of these discussions also shows one of the possible drawbacks of catalyzing communications through fast prototyping: the risk of focusing on specific details and losing touch with higher-priority issues, thus creating a situation of being unable to "see the wood for the trees" (Cantoni & Piccini, 2004). In the EAD project team, for instance, the issue of graphics and layout catalyzed most of the discussion, partly because of the scientific background of the team members. This fact can be analyzed from two opposite perspectives: On one hand,

it can be seen as a drawback in that, as already mentioned, focusing the discussion on details does not allow the overall picture to be seen, thus hindering discussion and decisions about more important issues; on the other, it can be turned into an advantage as well, in that the most important decisions can be made by the experts without long discussions. Of course, the responsibility for leading the discussion onto relevant issues and taking advantage also of discussions about details is up to the project manager.

However, on the basis of these discussions and of the results of the test phase, the prototype module of the EAD course was then refined and other modules developed according to a template that was approved by all partners. In June 2005, exactly halfway through the project schedule, 8 modules out of 12 had been developed and were ready to be delivered to students for a second test phase. Thus, half of the whole project time could be spent on implementing the last modules and testing and refining the whole course.

Color

The goal of this project was to develop a set of content, resources, and exercises both on the fundamentals of color (physics, perception, processes) and on color applications in different domains of the arts and visual communication. The project leader was the Dipartimento Ambiente, Costruzione e Design of SUPSI (Department of Environment, Construction and Design). The prototype of the first module (*History of color*) was developed in the first two months by the project leader and presented during a project meeting in November 2004.

The prototype immediately acted as a fuse in a powder keg. Facing a concrete object, the project partners made their thoughts clear and hidden misunderstandings emerged at once: Would the online resources be tailored to a specific partner's needs, or would they be more general-purpose? Would they foster offline activities, such as lab experience, or would the project invest in creating highly interactive online materials? The prototype triggered useful discussions, not only about the design and the graphical layout of the course modules, but also about more general issues regarding the project, such as the division of work, the assignment of tasks, the future use of the course, and so on.

Immediately after the first prototype, a second prototype module was developed (*Physiology of color*) and the general structure of the learning environment was designed. It is worth noticing here that in this case the rapid development of a prototype did not help the production of learning materials as such, but played a very important role in revealing some critical issues about the project itself, which had remained hidden during the drafting of the project proposal. Also in this case, focusing on general issues concerning the whole project might be seen as a waste of time, because they risk slowing down the project's progress; however, if these issues had not been faced immediately, a longer delay would have occurred, with very negative consequences on the development of the project. The project manager's task in this case was to have the discussion converge on key decisions, without letting it flare up into an argument.

Argumentum: E-Course of Argumentation Theory for the Human and Social Sciences

The goal of this project was to create a set of customized autonomous blended-learning courses about argumentation theory in different social contexts and for different educational purposes and targets. The Faculty of Communication Sciences of the USI led the project. In this case, the prototype module was the introductory module. This module had a rather particular status within the whole course, since it presented a general introduction to argumentation theory and was not conceived in order to be integrated into specific

courses, but was instead to be freely accessible to everybody on the Internet. The introductory course was developed (both in Italian and in English) by the project leader during the first four months of the project. It was presented to all the other partners during a project meeting in February 2005 and tested with about 60 USI master's students in the first half of the summer semester 2005 (March-April 2005). In parallel with the test phase, three other courses were developed by the project leader to be used and tested in the second half of the semester in three different USI master's programs. The presentation of the prototype allowed the project team to reach a rapid agreement about the graphical appearance of the course, so that the three other modules could be developed quickly.

The main function of the prototype modules was to help the project partners understand the possibilities, the opportunities, and the limitations of the learning management system in which the course runs. In fact, while the project leader had previous experiences with e-learning projects, the partners had not. Unlike the previously presented projects, the fast development of the prototype modules did not aim primarily at getting to a shared information structure of single modules, nor at fostering discussion, but rather at leveling the knowledge of the project team members about the technologies employed by showing them their main features and possibilities for use. In this way the project partners could see, for instance, how maps could be used as tools for the metaphorical representation of contents, for accessing the content, and for orientation during the navigation into the course; what kind of learning material could be used for what purpose (e.g., PDF files for case studies, HTML pages for general contents, video files for interviews with experts, etc.); how discussion activities could be implemented in the course; and so on. Leveling the knowledge of the project team by showing them some examples led to a shared concept about the general structure of the course and of the learning materials.

CRITICAL DISCUSSION AND CONCLUSION

Fast prototyping has been around quite a while, especially in human-computer interaction and computer science, as a way to foster user-centered design. Moving from the issues that have emerged in large multilingual and multi-institutional e-learning projects in the SVC program, our approach has considered the same approach as a communication catalyst. Fast prototyping can enhance e-learning development by improving both team communication and team commitment; it supports the development of a shared understanding of what is being discussed and designed and gives team members the opportunity to try out the e-learning experience in the first person and to be involved from the very beginning.

As for any development model, fast prototyping is not a panacea that ensures effectiveness and efficiency. Fast prototyping shows its advantages where (a) the project is quite big, (b) team members are not accustomed to working together, and/or (c) many of them have little experience in e-learning course development. Moreover, experience so far has highlighted a few conditions that seem to be required in order to make fast prototyping a sensible choice (or even a necessary one).

1. Fast prototyping costs. What is developed risks being rejected and demolished, even if in critical and fruitful demolition. In order to be cost effective, a sound ratio between prototype scale and the final product is needed; when this is not feasible, examples taken from other experiences may be used.
2. Fast prototyping is particularly helpful in order to provide a shared understanding of what the final e-learning course is likely to be; it offers the development team a common background where many misunderstandings can be avoided. Being multi-disciplinary, e-learning teams bring together people with very different backgrounds who need to

share a simple, effective, and efficient way of collaborating, each of them providing her or his own contribution, while acknowledging the expertise of others. It is important to note that committing to a human-centered approach implies that also the choice of fast prototyping itself has to be negotiated and shared among team members.

3. E-learning is a new world. It happens quite often that people working in course development do not have extensive experience. Fast prototyping provides them with a common language and an initial experience of e-learning. In fact, while point (b) above underlines the usefulness of fast prototyping to reduce team heterogeneity in general, (c) stresses its being a tool that enhances e-learning competencies inside the team.

These conditions are necessary but not enough to provide a sound fast prototyping experience. Two pitfalls in particular are to be mentioned here, both concerned with the prototyping speed. The first pitfall is the "quick and dirty" effect, (i.e., a very rapid but low quality development may negatively affect further developments, hindering understanding, collaboration, and commitment. The second one is just at the opposite pole in the speed scale: the non-fast prototyping case. Here the prototyping phase is extended so much that it only delivers a late contribution, which often has to be accepted as time resources do not allow substantial revisions. Continuous and endless prototype revisions turn into the biggest obstacle in the actual e-learning course development.

Successful e-learning projects are always team efforts (Botturi, 2006) and depend absolutely on the quality of team collaboration. The SVC experience has shown that classic ID models are often at odds with academic tradition when introducing e-learning technologies into higher education institutions, generating conflicts and misunderstandings. If properly managed and applied to a context that can benefit from it, a fast prototyping approach can provide an opportunity to enhance communication by providing a concrete focal point—the prototype—for discussion and design. This model can leverage on the human factor in order to achieve better designs and finally better e-learning applications.

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PROJECT WEB SITES

Argumentum: www.argumentum.ch

Colore: www.coloreonline.ch

EAD: www.ead-project.ch

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