# Key Factors of e-Learning: A Case Study at a Spanish Bank

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## Executive Summary

Given the evident potential shown by developing new technologies, there are increasingly more companies that develop and implement training programs that use the new-technology-based facilities. Likewise, suppliers developing new-technology-based programs have emerged seeking greater effectiveness and cost reduction as opposed to traditional education.

The purpose of this research is to analyze and understand the training program delivered by a Spanish bank. The main research should address the following question: What factors influence, and in what way, the adoption of technology-based training programs and such programs' success and goal attainment? To the main question, research questions should be added that focus on the following issues: What are the factors regarding content and how do they influence the adoption of technology-based training programs and such programs' goal attainment? What are the factors regarding learners and how do they influence the adoption of technology-based training programs and such programs' goal attainment? What are the factors regarding tutors and how do they influence the adoption of technology-based training programs and such programs' goal attainment? What are the factors regarding technology and how do they influence the adoption of a technology-based training program and such programs' goal attainment?

This research was based on case study. Emphasis was placed on the data collection and its analysis and interpretation to minimize validity and reliability problems. Data was collected through interviews with training directors, e-learning project head, participants and tutors. Other sources used were observations, documents and file records.

Fourteen factors influencing the use and success of a new-technology based training program have been found. Some of the factors that emerged were: type of course content, teaching mode, course evaluation system, course development process, participant's profile, professional tutor profile and technology satisfaction. Finally, these factors were grouped into four components: content, participant, tutor and technology.

The results of this study may contribute to future research on this issue developed mainly under a firm context. The conceptual framework developed could be the basis for future research, as it holistically examines several factors intervening in the success of a training program. The framework could also be useful to give a complete view of the issue or a more specific one when examining each factor separately, as opposed to



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other studies developed which examine two or three factors together.

# Introduction

Faced with the globalization of markets and the trend towards deregulation, firms are coming to the conclusion that success or failure depends on their capacity to respond rapidly to market opportunities and threats. And that capacity depends on the professional development of their employees. Furthermore, technological changes present new challenges to employees, as their newly acquired knowledge is soon obsolete. There is, therefore, a need for professionals to continually acquire new knowledge and skills, and, more importantly, develop their individual capacities to enable firms to compete effectively.

At the same time, in recent years there have been considerable advances in information technology. Traditional media such as chalk, blackboard and overhead projector, which are attractive for their low cost and low level of complexity, are being supplemented by new technology-based media. These include discussion forums, chat, e-mail, multimedia applications, Internet-based educational applications, and others. Though more expensive and more complex to develop and implement, these media allow improvements in the development process; for instance, they enable the delivery of training without time and space constraints (Geber, 1990), taking the employee's needs into account, and in a fast and effective "just-in-time" manner (Masie, 1999). They can also allow improvement in content presentation and generate new ways of attracting the learner's attention (Alavi & Leidner, 2001); different ways to develop perception, memory and understanding; and opportunities for learning individualization and personalization. In addition, participants can access documents in a non-linear way, without the drawbacks of textbooks (Shohreh & Garland, 2000).

Regarding this potential, many American and European firms, such as Cisco, IBM, EDS and Deutsche Bank, have recently adopted new training technologies as a means to overcome certain disadvantages of traditional training when geographically distant professors and participants need to be gathered in the same place. The constraints have to do with mistiming, high costs, and non-adaptability to employees.

It is within this context that this case study seeks to determine the key factors that have enabled a Spanish bank to successfully implement a new-technology-based training program. We consider Internet and related technologies (Worldwide Web, e-mail, discussion forum, chat, and videoconference) as new technologies, and not other technologies such as CD-ROM, DVD, TV, telephone, radio, etc. A training program is usually made up of a set of training actions that can take the form of seminars, workshops, or courses, though the regular mode is courses.

The study starts with a brief introduction to the issue of training through new technologies. It continues by presenting a literature review and the initial conceptual framework. Then, the research questions are formulated and the research method and design are described. Next, some topics are discussed to help get an overall idea of the case study; for instance, how the virtual campus was initiated, what issues are covered through e-learning, and how learning takes place. After this, results are presented and are linked to the factors that make e-learning successful. Lastly, the study considers implications for future research and constraints, and finishes up with the conclusions.

# Literature Review and Initial Conceptual Framework

Most of the research conducted on the use of technology in training has focused on the study of the factors that influence efficiency in the learning process and on testing whether technology could yield better learning than traditional training. However, the literature shows that whether traditional training is better than technology-based training is still a matter of controversy (see,

for instance, Ahmad, 1999; Arbaugh, 2000b; Jaffee, 1998; Kennedy, 1998; Orr, B., 1997; Russell, 1997).

In our view, there are several possible reasons for this controversy. Firstly, learning is complex; as people and contexts are different, it is difficult to specify radical rules and procedures that will ensure learning. Secondly, learning is influenced by many factors. For example, Kizzier & Pollar (1992) propose a research agenda, using a model that contains twenty-six factors grouped into seven components: learning process, learner, teacher, content, cost/benefit, environment, and technological resources. Thirdly, studies have focused on the issue of effectiveness from different points of view, exploring diverse key factors. For instance, studies that have found a positive effectiveness of virtual learning have been conducted by controlling for the objectivist learning model. In turn, studies that have yielded negative results for virtual learning have controlled for certain participant-related variables. Fourthly, studies have been carried out in different contexts, such as universities, business schools and firms. Finally, studies have used different technological bases for their experiments, such as videoconferencing, or interactive software (Computer Aided Instruction or video).

From the above, one can infer that there are various factors that can influence the success of a technology-based learning program and that, in general, those factors are related to four components: content, participant, tutor, and technology. As for content, there are two main factors: learning models and course design. With regard to the participant, there are again two factors: the learner's characteristics, and his/her cognitive process. Tutors have three factors: their personal characteristics, the role they play, and their teaching style. And technology has two factors: the environment's facilities, and technology satisfaction. These factors are examined below.

# Contents

## *Learning Models*

Learning theories help to understand how people learn; consequently, more appropriate learning programs can be designed based on such understanding. Educational psychology researchers and professionals have developed several interpretations and theories of the learning process. These theories can be classified into two main models: objectivist and constructivist. According to these models, people learn when they become capable of doing something more than what they were able to do before; in other words, learning involves developing new capabilities that enable people to carry out new actions or perform tasks more efficiently than before. Objectivist models thus assume that learning is observable. Constructivist models, by contrast, assume that learning is inferential; therefore, it cannot be directly observed, although its results can.

The major assumptions of the objectivist model are that teachers are the source of the knowledge that needs to be transferred to the learner for an uncritical absorption of facts to take place, and that teachers have control of the material and pace. In contrast, constructivism assumes that people learn better when they discover things for themselves, and when they are able to control their learning pace by seeking support from the teacher rather than direction (Ahmad, 1999). It emphasizes social, cultural and humanistic issues, as well as subjectivity, as critical factors. Learning is attained through socially-created opportunities, interaction with other people, and highly personal insights, all of which make changes in behavior possible. Subjectivity is present because each person takes and processes information in a unique way by reflecting into the process his or her beliefs, attitudes, past experiences, and feelings.

These two models are compared in Table 1.

**Table 1. Comparison of learning models**

| Models / Characteristics | Objectivist | Constructivist |
|---|---|---|
| Way in which learning is attained | • People learn through associations between stimuli and response. An adequate response is achieved after a specific stimulus has been presented.<br>• Objective-based. | • People learn by reflection, building personal interpretations of the real world based on their individual experiences, values, and interaction with other people.<br>• People remember knowledge needed previously to accomplish a given task, then organize information relevant to the problem, understand it, and finally gain the necessary insight to select a course of action to address the task.<br>• Subjective-based. |
| Factors influencing learning | • Environmental conditions –stimuli arrangement and presentation.<br>• Learners – because they are the basis for determining which reinforcement is the most appropriate.<br>• The teacher, who determines effort and gives feedback to modify conduct. | • The learner's interaction with environmental conditions.<br>• Learners, with their attitudes, capabilities, skills, and experiences.<br>• Feedback from teachers and people present in the environment. |
| The role of individual capabilities | • Little importance is given to individual capabilities. Instead, individuals study environmental conditions. | • Individual capabilities play a very important role, elaborating and interpreting information.<br>• Individual capabilities do not seek to retrieve facts from memory in the same way as if they were present in the real world; instead, they retrieve several facts from the real world, and adapt them (build something new and innovative) for each situation or problem. |
| Types of tasks | • Structured. Tasks require little cognitive effort, that is to say, a lower processing level. Moreover, they can be learned by adequately designing the environment through associations between stimuli and response.<br>• For example, the learning of concepts and their attributes. | • Non-structured. Tasks require a more complex intellectual effort because they demand a command of a body of knowledge, and they have to be organized and applied. Moreover, tasks are learned when people construct personal interpretations of the real world based on individual experiences, values, and interactions with other people.<br>• For instance, complex problems. |
| Principles that must be taken into account when designing a teaching program | • The environment is designed to optimize transference, so that learners can respond to stimuli appropriately.<br>• An association is sought between stimulus and response.<br>• Reinforcement is used.<br>• The learner is considered as a passive agent.<br>• Teachers are the main source of knowledge. | • The learner has control over learning and is the one who manipulates information. She is considered as an active agent.<br>• Teachers are considered as facilitators and/or monitors.<br>• Knowledge is not abstract; instead, it is linked to a given context. |

In a web-based learning study, Ahmad (1999) found that the objectivist model could be more effective in a virtual environment than the constructivist model. The author had proposed just the opposite, because theory supported that high levels of control facilitated effective learning, and control and flexibility are among the advantages offered by the virtual environment. In particular, hypertext allows the learner to decide in what order she will access the different pieces of information, establish the pace, quantity and depth of the required information, and focus on the most relevant issues; in other words, it facilitates learning control. In addition, the features and assumptions of the constructivist model (such as people learning better when they discover things by themselves and when they control the learning pace) are better suited to a virtual environment than to a traditional one. In our opinion, this result can be sustained because the type of course content in the study was technical, and therefore structured (procedural). According to Silber (1998) and Ertner & Newby (1993), it is the objectivist model and not the constructivist model that is most appropriate for teaching this type of content. Alavi, Wheeler & Valacich (1995) found that face-to-face, collaborative and distance collaborative learning are equally effective in terms of knowledge acquisition, but that the distance environment seem to yield better results in terms of critical reasoning skills. The authors sustain that this is not consistent with technological media features and their effect upon communication, which can result from the participant's motivation for a novel environment that offers the possibility to interact with peers from their place of residence. Consequently, in view of the above, we can say that there is no conclusive evidence that the virtual environment is more appropriate for either constructivist learning or objectivist learning. Everything will depend on the content type. Hence, one can work with both types of learning –objectivist and constructivist– in the virtual environment; it will depend on the type of course content.

## *Course Design*

Gagné (1985) holds that course design is closely related to a learner's attainment of positive learning. He has identified the following nine aspects that should be considered when designing a course: gaining attention, making objectives explicit, stimulating recalling of previous learning, presenting content, providing "learning guides", obtaining performance, providing feedback, assessing performance and providing reinforcement, improving retention, and transferring it to work.

Alavi & Leidner (2001) argue that new technologies offer new ways of content presentation or new ways to gain the participant's attention –text, color, graphics, audio, video and many other data formats– but there is no empirical evidence. Likewise, Hannafin, Hannafin, Hooper, Rieber & Kini (1996) also find that although many authors have generated design guidelines, the empirical research that sustains these principles is very scarce.

Guidelines for interface design must be interpreted according to the type of environment, content, users and context (Schneiderman, 1992). A sober screen design should be sought but of an appealing visual appearance. The screen background should not be overloaded with colors, as it may disturb (Hannafin & Peck, 1998); nor should many font types be used. Research has failed to prove that colors represent an important learning variable (Hannafin et al., 1996), although they are considered as a variable of secondary influence. Colors are more effective when they support other learning aids, such as the organization of information and objects on the screen. Another important aspect of interface design discussed by Schneiderman (1992) is the screen definition and separation of areas. It would seem advisable to differentiate control areas from content areas, and define navigation items, preferably with icons, text and links in an independent section. Navigation among screens is another important aspect of interface design. It should be logical and effective, with icons that serve as guides for navigation and with site maps that clearly show possible routes. They should not have any hierarchy and should also be consistent with the color and text of the screen design.

Internet technology can facilitate personalization (participant's control). In a study, Chung & Reigeluth (1992) comment on what should and should not be done when designing a virtual environment to give the user control. Virtual environment designers may determine the degree of control according to the teaching objectives. There are three types of control: learning pace control, learning sequence control, and learning content control. The authors suggest that learners should be given control of contents if they have previous significant knowledge of the topic under development. They should also be given control of contents when the teaching objectives are of a high-order cognitive type. As for sequence control, the authors suggest that learners be given control when the teaching program is rather long. However, free control can be detrimental if given when there is no clear order in the learning objectives.

On the other hand, it should be borne in mind that, generally speaking, interactive multimedia courses on the Web or on compact disk (CD) are complex and costly to produce. In particular, Gros and Spector (1994) point out that developing such courses takes a lot of time and requires a team of experts in the learning process, technology (multimedia, graphics, sound, animation, etc.), and the topic being taught. McArthur, Lewis & Bishay (1993) state that multimedia-based courses aim for a higher degree of cognitive development in learners (such as reflection). They are generally developed through the use of artificial intelligence concepts, neuronal networks, and expert systems in particular.

## *The Learner*

Some of the characteristics of a learner are closely linked to his learning. Learner characteristics are: intellectual capacity, ability, experience, personal willingness (Ertner & Newby, 1993; Silber, 1998), learning style (Kolb, 1984), work commitment (Trace, Hinkin, Tannenbaum, & Mathieu, 2001) and motivation (Mathieu, Tannenbaum, & Salas, 1992).

Nowadays, most people do their daily job or a given task with the help of technology; however, it has been noted that certain individual characteristics make some people use and work with technology more than others. Zmud (1979) has classified these personal characteristics into three groups: demographic (age, sex and training), personality-based (attitude, motivation), and related to cognitive style (the way a person analyzes and evaluates data). He has found a relation between these variables and technology use.

Personal commitment and effort are very important when learning through technology, as there may be constraints that cause negative learning (Hiltz, 1986). The learner's commitment to study must be greater when learning through technology than in a traditional environment (Alavi, Yoo & Vogel, 1997). Likewise, the learner's attitude is vital for a positive virtual learning outcome. Motivation is another important factor needed to achieve positive learning through technology (Hiltz, 1986).

A learner's learning process can be a determining factor in the effectiveness of a technology-based program (Kizzier & Pollar, 1992).

Alavi & Leidner (2001) maintain that technology can efficiently support a learner's cognitive activities, such as information selection, coding and understanding; however, there is insufficient empirical evidence. Makkonen (1998), Shohreh & Garland (2000) and Jonassen & Reeves (1996) point out that hypertext/hypermedia can be considered as a facilitator when learners build their own knowledge. Similarly, Kommers & Lanzing (1998) argue that hypertext/hypermedia facilitates the selection of documents (pages) and supplementary information that need to be consulted, as different content units are distributed in a node network interconnected by links. This allows the participant to take greater responsibility for learning; that is to say, each learner determines what is important to know and how to learn it. Rouet & Jarmo (1996) sustain that hypertext can be considered a powerful learning tool, as there is an analogy between the structure of hypertext and the structure of contents in human memory. In both cases, knowledge can be represented as a

complex network that is densely interconnected. Kozma (1991) notes a parallel between hypertext technology and mental models that form associations (links) among various ideas by constructing meaning from these relations.

Some studies have found that multimedia-based learning is at least as effective as traditional learning, besides being faster (up to 30% time saving). Other studies, however, have been unable to determine whether multimedia is more appropriate than conventional learning. Moore, Burton & Myers (1996) maintain that although there is some evidence, not enough empirical tests have been conducted to allow us to conclude anything about the effectiveness of multimedia.

Internet and its tools (such as discussion groups and electronic mail) may facilitate cooperative learning, allowing people to work and discuss together, thus developing their cognitive processes and constructing their own knowledge. Moreover, technology-based learning provides learners with the opportunity to interact with experts located in other parts of the world (Alavi, Wheeler & Valacich, 1995; Bigelow, 1999), which can provide them with different and multiple perspectives on a given topic.

Vygotsky (1978) emphasizes the important role of social interaction in the learning process. Reigeluth (1999) defines two types of interaction: human and non-human. Within human interaction, there could be three types: participant-professor, participant-participant (working with participants or using participants as resources), and participants-other people (interaction with community members or other individuals). Non-human interaction can be classified into participant-tools (using tools with the capacity to help task completion), participant-information (working with available information), participant-environment (using and working with simulations and other resources), and participant-others (working with other non-human resources).

Webster & Hackley (1997) argue that interaction is a critical factor when learning takes place through technology. When there is no interaction, participants can easily get distracted and focus on other activities, which may result in negative learning. On the other hand, it is important to foster interaction among participants, so that the classroom can be perceived as a virtual learning community where an exchange of experiences takes place, rather than as a private session between tutor and learner (Almeda & Rose, 2000).

## *The Tutor*

Ulrich & Greenfield (1995) maintain that tutors for in-company training programs should preferably be middle managers belonging to the firm, with high potential and sound knowledge of the firm's business and culture. They will benefit from gaining expertise while modeling the concepts they teach. This is very appropriate for middle-level professionals because it contributes to their ongoing development. Nevertheless, this recommendation does not exclude hiring external tutors, if complemented by ideas and perspectives from inside the company. Knowles (1975; Knowles, Holton, & Swanson, 1998) comments that a tutor's characteristics and abilities should include not only on knowledge and preparation (being an expert) but also the power of understanding (developing empathy), power of commitment and encouragement (being enthusiastic), and the power of language and organization.

Webster & Hackley (1997) point out that tutors' attitude towards technology may affect their students' learning results. For instance, professors who lack the patience to deal with technological problems may negatively affect their pupils' learning.

Hence, it is suggested that the profile, characteristics and attitude of the tutor can be important variables for the success of a training program.

The role a tutor plays can be classified into three aspects: cognitive, affective and managerial (Coppola, Hiltz & Rotter, 2001a). The cognitive role concerns the mental processes (perception, memory, and thinking) that a tutor uses to provide participants with feedback, evaluation and in-

formation. The affective role is related to the relations established between tutor and learners; for example, encouraging and motivating them (Reigeluht, 1999). And the management role implies planning, running and controlling the course.

Ertner & Newby (1993) point out that the tutor's role differs according to the learning model adopted. A very important factor in the objectivist model is the environment design, as it helps to optimize knowledge transfer, which in turn helps learners to respond appropriately to stimuli. Hence, the tutor is the main source of knowledge. In contrast, in the constructivist model the tutor is the facilitator and/or monitor because knowledge is generated when learners interact with their peers and teachers.

In a study, Coppola, Hiltz & Rotter (2001a) found that the tutor's role is different in virtual environments. The tutor now is more of a facilitator and mentor. Besides answering content questions, tutors direct learners towards the right answer, help them understand concepts and problems, guide discussion and foster debate among participants. In addition, they tend to be more accurate in material presentation. They usually maintain closer communication with participants, in spite of the common constraints found in virtual communication, such as lack of gestures, voice pitch, etc.

Tutors may put in more hours in virtual learning than in traditional learning. Almeda & Rose (2000) sustain that virtual tutors spend a lot of time sending mail and replying to forum questions because there is a greater information flow and because participants working in a virtual environment expect more support than in a face-to-face environment. For instance, they expect their mail to be replied to promptly; otherwise, they perceive the delay as an obstacle to their learning process.

From the above, it can be inferred that the role played by a tutor may be a very important factor for the success of a training program.

Teaching style can be a determining factor in the effectiveness of a technology-based program (Kizzier & Pollar, 1992). Leidner & Jarvenpaa (1993) hold than in a virtual environment the teacher's style is an important variable for gaining the participation of students. Learners participating in classes where there is more interaction have positive attitudes towards learning and feel more satisfied (Arbaugh, 2000a). The teacher's style is more informal than in the face-to-face method (Coppola, Hiltz & Rotter, 2001a). For instance, these authors mention the case of a tutor who entertained his students by presenting Power Point transparencies that contained mistakes.

Almeda & Rose (2000) and Coppola, Hiltz & Rotter (2001b) point out that in a virtual environment, the interaction between tutor and students is almost always asynchronous, as it can take place without any prior coordination and messages can be left at any time. Almeda & Rose (2000) also note that participants do not always show up when they are called for a virtual session.

## *Technology*

Some of the most relevant characteristics of virtual learning environments, such as the flexibility and control they offer learners, can be considered as factors that learners take into account when deciding to use a program. Flexible learning is understood as the ability to complete a training activity without any time or space constraints. Learner control is the capacity that a learner has to alter some of the activities in the learning process.

Milheim & Martin (1991) define three types of control that a learner may have: learning pace control, learning sequence control and learning content control. Learning pace control refers to the speed with which course themes are presented. Learning sequence control has to do with the order in which course themes are presented. And, learning content control is the learner's ability to omit certain content themes when they consider that they are already familiar with them.

Jonassen (1991) suggests that the objectivist model is not suitable for courses where participants are given control. That is because the basic assumptions of the objectivist model do not include giving the learner any responsibility, but rather that learning should be externally transmitted through teaching. In contrast, the constructivist model suggests just the opposite; learners are required to generate or construct their own knowledge; therefore, they must have a high degree of control over their learning process. On the other hand, hypertext facilitates the structuring of content in modular or interlinked virtual courses because it allows learners to decide in what order they will access the information. It also allows them to decide the quantity and depth of information they need, and skip forward or go back to an earlier point (Makkonen, 1998), hence facilitating learner control. From the above, it is assumed that virtual learning environments are more favorable for the implementation of constructivist learning methods that encourage learners to take control.

It is important to stress that research into the effect that learner control may have on the learning process has been inconclusive. Merrill (1994) found that many studies indicated a positive impact on the effectiveness and efficiency of learning environments when learners were able to control some of the course components. In other studies, however, he was able to find only marginal support for the effectiveness of learning environments in which control is given to learners. Penland (1979) found that participants prefer to learn using their own resources because they wish "to establish their own learning pace", "use their own learning style", "maintain their learning way" and "define their own content sequence". In a literature review, Ahmad (1999) maintains that nothing definite can be said about the effectiveness of learning environments where the learner is given control, as everything will depend on the context.

Reliability, quality and richness of the medium may all have a key influence on the learning outcome. Webster & Hackley (1997) state that technological drawbacks may lead to negative learning in learners. Learners become impatient when instructors struggle with technical problems, and this makes the class less competent. For instance, participants often criticize the poor quality of communications in videoconference presentations, which constrains interaction richness among them.

Allen (1977) and O'Reilly (1982) suggest that people prefer to use technology because it enables them to access information faster, not because of its quality. That is to say, priority is given to easy access rather than excellent quality when presenting hard-to-access information. Culnan (1984) stresses that attributes such as ease of access and reliability are more relevant than quality. Precisely one of the most important features of Internet technology, in particular the Web, is instantaneous access to material at a very low cost.

## Research Question

The literature review shows that there have been several research studies on training and training through technology, but very few empirical studies that consider new technologies in the context of the firm. Moreover, research has been conducted mainly from the perspective of training researchers and only rarely from the information systems perspective. Alavi and Leidner (2001) note that the systems area traditionally researches on topics such as technology-based organizational structure and processes, as well as information technology applications to cognitive processes, which may serve as a basis for enriching the learning process through technology. Leidner and Jarvenpaa (1995) point out that the adoption of new technologies in the training process has been delayed by up to a decade, in spite of the proven benefits of information systems in improving communications, collaboration and effectiveness in the firm's decision-making.

This study covers these research gaps. Factors influencing the use of technology-based training programs in firms are examined globally. The main research addresses the following question: What factors influence, and in what way, the adoption of technology-based training programs and such programs' success and goal attainment?

The secondary questions that guide this study are as follows:

- What are the factors regarding content and how do they influence the adoption of technology-based training programs and such programs' goal attainment?
- What are the factors regarding learner and how do they influence the adoption of technology-based training programs and such programs' goal attainment?
- What are the factors regarding tutors and how do they influence the adoption of technology-based training programs and such programs' goal attainment?
- What are the factors regarding technology and how do they influence the adoption of a technology-based training programs and such programs' goal attainment?

The main unit of analysis is the training program. The units embedded in it are the participants, tutors, contents and technology.

## *Research Design and Method*

The case study method was used to examine research questions that explore new-technology-based training programs delivered by a Spanish bank along a six-month period.

Case study research is appropriate when the phenomenon is relatively little known. The studies conducted to date on this issue seem inadequate due to poor empirical foundation or conflict between studies (Eisenhardt, 1989). A lack of theoretical studies has been found in the literature review, perhaps because the theme is new or because Internet advances have only recently allowed the development of training applications. On the other hand, Yin (1994) presents a matrix that can help to decide what research method to use. The decision is based on three conditions: the form of the research question, the degree of control that the researcher has upon behavioral events, and whether the research focuses on contemporary or historical events. First, in this study, the research questions are of the "how" and "what" type. Secondly, no control or manipulation was exerted over the behavior of tutors and participants, or over virtual classes. Instead, learning was expected to take place from the emerging events and themes. Finally, a contemporary focus predominated in this study. This analysis confirms that the case study was the appropriate method.

Four sources were used to obtain data: intensive interviews, documents, file records and observation, interviews being the most important. The use of several sources facilitates cross-checking of data (Yin, 1994).

Intensive interviews were conducted with course participants, tutors, the project director, content coordinator, management coordinator, evaluation coordinator and technological coordinator. Interviews were planned beforehand in each case in terms of their purpose and protocol. The interview format was semi-structured, leading to fluent conversation and discussion because it was thought that this format would yield more revealing answers than the concrete and closed question mode. There were 21 interviews in total, 17 face-to-face and 4 over the telephone. Each interview lasted between half an hour and an hour and a half. They were conducted in Barcelona and Madrid, depending on the interviewee's workplace.

Among the main documents used were the firm's annual report, the training department annual report and organization chart, the project organization chart, and catalogues and brochures used in marketing campaigns. There were also video recordings of previous project presentations.

Observation of the virtual campus was a very important source of data that served various purposes: understanding the nature of the virtual environment, course structure, course content, type of applicants, time spent by students on campus, the activities of tutors, discussion forum movements, platform facilities, implemented options, campus response timing, technological con-

straints and type of pedagogical design, among others. Observation is a very useful means to obtain additional information on the topic under study (Yin, 1994). Direct observation (Yin, 1994) was carried out for a period of one hour, three times a week for three months, and all events and activities that took place during the observation period were recorded, as recommended by Creswell (1998). Brief notes were used during interviews with course participants and course developers.

Records consisted of statistics, drawn up in order to carry out course control and follow-up, such as the number of students in each group, number of participants, each participant's profile in each course, on-line time for each participant in each course, etc.

## *Case Background*

The subject of the study is a leading bank in the Spanish and Latin American financial sector which is also among the world's top twenty banks in terms of stock market capitalization. The bank arose as a result of the merger of three large financial institutions. The first merger took place in 1991 and the second in 1999. By the end of 2000, the bank had a network of 10,827 branches in 40 countries, more than 38 million customers and more than 126,757 employees. That year, it had after-tax profits taxes amounting to more than 2.25 billion Euros, granted loans for 169.38 billion Euros, and had 437.57 billion Euros of funds under management.

The bank's entrepreneurial strategy focuses on maintaining its leading position in the Spanish market, reinforcing its position in Latin America and Europe, and maximizing value creation for its shareholders. Hence, it has engaged in a diversification process, acquiring other banks and financial services –such as retirement fund managers– and reinforcing its equity holdings in large allied banks through a strategy of multi-brand and specialized partnerships. It has also invested in new technologies and has placed many of the bank's operational processes on its intranet. Currently, it is using the Internet as a new channel to offer its products and services.

The bank delivers mainly four types of training programs. Firstly, institutional training addressed at professionals and managers in charge of the group's basic managerial processes; for example, training courses for managers. Secondly, area training support programs oriented to area professionals to enable them to carry out operative and strategic plans; for instance, programs and courses for retail banking and programs and courses for tele-banking. Thirdly, career-associated training oriented towards specific groups, such as programs and courses for personal banking managers or internal auditors. Finally, training focused on individual needs oriented to professionals willing to develop their competence –professional knowledge, skills and qualities– and aimed at fostering their personal development; for instance, programs and courses on technology, and systems information and processes.

These four types of training programs are delivered through diverse modes: face-to-face, virtual, traditional distance (paper-based), distance (cd-rom) and videoconference. The following variables are considered when selecting a channel: number of participants, demand in areas, geographical locations, course development timing, content type, minimum level of interactivity (tutor-participant relationship or participant-participant relationship), costs, degree of relevance for the bank, etc. In general, the face-to-face mode is chosen when the number of participants is low, the target population is small, the training activity is urgently required, content relates to managerial skills or if the theme is strategic for the Bank. Therefore, not only is the transmission of knowledge needed but also the participants' motivation and sensitization. The virtual mode is chosen when course demand is high and the course has to reach every part of Spain, when content is not related to managerial skills and when the budget is small. CD-ROM distance training is favored when course demand is also high and all parts of Spain have to be reached, but the Internet is not available, and in particular, when the course content demands a multimedia-based design. Finally, videoconferencing is chosen to deliver conferences, for instance, when managers present their annual results to all the bank's staff.

## *Virtual Courses Onset*

In 1999, the Bank decided to start to develop e-learning courses in response to various situations arising at that time. Above all, they wanted to match the Training Department's strategy with one of the corporation's strategies: the commitment to new technologies. One way was to serve as the content provider for the bank's intranet by facilitating the implementation of on-line courses. The Training Department Director commented:

> "During the first stage of the intranet implementation, we became the driving force in the technology area; employees knew that they had access to the intranet because we informed them that they were already registered for on-line courses."

In second place, employees were to be encouraged to use new technologies. When participants follow a course, not only do they learn the content but also new ways of doing things; in other words, new organizational practices are created that may spread as the number of employees doing the training increases. Thirdly, costs were also a consideration, especially in the context of a merger process. Fourthly, courses had to be developed for large numbers of employees spread all over Spain and there were plans to extend the training to all the bank's branches in Europe, Latin America and the United States. For instance, in order to obtain the ISO quality certification, the Quality Course had to be delivered within a period of three months to almost all of the bank's employees. The Technology and Distance Learning Director commented:

> "This does not seem such a challenge in an on-line world; face-to-face, however, it would certainly be daunting. It would take a tremendous amount of classrooms and logistics at every site (at national level)."

Fifthly, all employees were to be given access to training without disrupting work; for example, in offices or branches with few employees the absence of one employee could be critical.

Sixthly, the training strategy had a strong corporate sense, which implied trying to adopt common solutions for the entire Group. The Training Director's comments in this respect are worth noting:

> "Creating an e-Learning network allows us to establish corporate training in a much simpler way than through a face-to-face mode. This means that we can generate common criteria for management training, such as creating communities and facilitating experience exchanges among all employees from their own locations – Europe, Latin America and the United States."

Seventh, the training process had to become more efficient to adapt to the newly merged organizations; and one way to achieve that was through on-line courses. The Training Director commented:

> "We have gained a lot with e-Learning as far as the management capacity of the Training Department is concerned. For instance, before we used to have a great deal of CBT-based training, but that caused us problems with CD distribution, installation and functioning. What's more, a new CD had to be delivered every time contents were updated, etc."

Finally, virtual training took advantage of the type of synergy produced by the merged banks.

## *What Can You Learn Through e-Learning?*

Continuous training courses can be taken on a variety of topics. Courses have been designed to cover training needs emerging from the different functional areas, the Bank's new strategies, or simply from policy or environment changes. For instance, some of the courses are about the final user's computing tools – Microsoft Office, Business-related Internet service, Basic Internet, Advanced Internet. There are courses on Products and Services for the bank's customers, Customer Service, Legal aspects of the Stock Market, Banking Quality, Civil Law, Distraint, and English. These courses are continuously evolving. Course content is changed based on suggestions from

tutors and participants while taking the courses and on the experience gained. In addition, more courses are being developed.

In the virtual campus, one can also find the so-called “pills”, which are knowledge and information units on very specific topics that help employees solve specific problems encountered in their daily work and which require a quick response. For instance, information on retirement plans, the Euro, communications, etc.

In addition to courses and pills available in the virtual campus, there is a very varied information space with advice on how to improve competence, ideas on how to work in teams, self-assessment tests, how to motivate an employee, etc. In other words, the virtual campus is intended to be a space that facilitates both formal and informal learning. This is what the Distance Training and Technology Director had to say on this issue:

> “Our campus must be seen as a place to learn. Obviously, one of the most formal ways are courses, but there is also an informal way, such as learning through looking at an item in a cafeteria, reading a simple recipe or instructions for a game, etc.”

To date, out of a total of fifty-two courses, there are fifteen on technology and information systems, eighteen on customer advice, seven on economics, finance and risk, two on managerial capacities, nine dealing with legal issues, and one English course. There are also more than twenty knowledge pills, 420 managerial recipes, 24 topics from the Harvard Manager Mentor, 190 articles classified by mega-competence, and 20 operative commercial solutions. And more are under development.

### *How Do You Learn?*

Learning is mainly centered on reading and solving the proposed self-assessment exercises. If the participant has any doubts, he can ask the tutor. The self-assessment tests facilitate immediate feedback on the participant’s answers, allowing for re-taking the tests if results are not correct. Some courses are based on simulations, where learning is centered in solving a case; if participants have any doubts, they can request help from a tutor.

In general, participants have four months to complete a course, according to a timetable which indicates a beginning and ending date for each course. Usually, each course lasts 15 hours.

## Results

The emerging factors were as follows. With regard to content: types of content, teaching style, evaluation system, course development processes and course design. With regard to the participant: personality features and the learning process. With regard to the tutor: professional profile, personality features, role, interaction and available resources. With regard to technology: facilities offered by this learning mode and technology satisfaction. All these factors can be considered as issues supporting the use of the program and its success.

### *Content*

#### Types of content

The literature suggests that a key factor for the success of a virtual program is the type of content, as the choice of a particular learning mode may be related to the type of content. Massy (1995) remarks that structured contents seem to be more suitable for work in virtual environments than in the face-to-face mode because new technologies easily support their standardization. In particular, hypertext is ideal for working with well-defined, structured contents, as it allows them to be divided up without any difficulty.

From the interviews, it was assumed that one of the criteria used for selecting the virtual mode is that the course content should not be related to managerial skill development. The Director's statement in this respect is clear:

> "I cannot conceive of training actions for managerial or commercial skill development based exclusively on e-learning. Tools and techniques that help people develop these skills can be transmitted on-line, but the skills themselves need to be developed in the classroom by interacting with peers, observing things directly, role-playing and discussing case studies, and that cannot be done on-line."

When the campus was visited, it was observed that courses have monographic –structured– contents; this means that tasks completed in order to achieve the desired learning objective need little cognitive effort. In addition, these courses are basic and general, and are mostly addressed to non-specialists in the subject. These are the words of the head of training in the legal division:

> "With these courses, employees are not expected to become specialists in a given subject; for instance, the course on distraint aims at providing general knowledge on the topic and not at enabling lawyers to sue anybody."

Learners also perceived the virtual campus courses as structured. As a participant stated:

> "The course was alright for me, it gave me the knowledge I needed, and the course was monographic and comprehensive. I did not want to become a specialist in the subject; I'm a lawyer working in the risk department, so I'm not involved in procedural matters."

## Teaching method

Another factor for the success of a virtual program, as suggested by the literature, is the learning model; the learning mode can be related to the learning model. Ahmad (1999) found that the objectivist model could be more effective in the virtual environment than the constructivist model. Likewise, Ertner and Newby (1993) and Silber (1998) claim that objectivist models are more appropriate for learning concepts and procedures, in other words, structured contents.

During visits to the virtual campus, it was observed that the teaching model used in courses is the objectivist one, where students learn by rote. This model is considered the most appropriate for structured contents and the one that facilitates self-study.

## Evaluation system

Another factor emerging from the data analysis was the course evaluation system. The Training Director remarked that one of the factors that can contribute to the success of the program is the fact that "the courses are not graded" because adults do not like to be evaluated. In his own words:

> "Evaluation is not well perceived in adult training, while self-assessment which is seen only by the student is more intimate; nobody corrects you, it is better perceived."

The Training Director also observed that there is no need for evaluation as these are personal development courses. Nevertheless, at the end of each course and module there is a self-assessment exercise or test based on multiple choice questions or alternative answers (yes/no, true/false, agree/disagree).

On the other hand, the person in charge of evaluation explained in an interview that in order to improve courses, participants are asked to fill out a quality questionnaire (course satisfaction). This includes a series of indicators related to the degree of fulfillment of the training activity, such as course applicability, participant satisfaction, responsiveness to course registration, content clarity, etc. The person in charge stated that at the end of the course, participants fill in a form if

they wish to request a course diploma, which is issued in digital form and signed by the Director General in recognition of the participant's effort.

## Course development process

Another factor emerging from the data analysis was content development within the firm and the way it should be developed. During an interview with the person in charge of contents, remarks were made on the development of contents by the firm itself as a factor for program success. That is because a course does not only transmit content but also many other implicit issues, such as the firm's culture, the way the firm understands certain issues, etc. Most of the contents developed within the institution pertain to the banking business.

According to the content developer, the content development process is complex and long. Contents are created jointly by the expert division that requests the courses, the tutors, who contribute ideas and write on topics in which they have experience, and the people in charge of the contents. The expert area provides the content text, including the module structure, the self-assessment test, drawings, schemes, links or cases, etc. Sometimes, if content is too specialized, the expert area outsources the course content from consultancies or outside experts. Later on, the people in charge of content convert it into digital format following basic design criteria. Next, the computing work is completed by publishing the content in the virtual campus using a development tool (through which a typical course structure is designed in the form of a basic pattern that in turn is filled in with specific contents). On some occasions, a tool is used to generate HTML pages from Word documents. At other times, when contents are more heterogeneous, web pages are developed using other products, such as Front Page. Before ending the process, several meetings are held between the people in charge of the content and the expert area in order to approve course publication. Finally, a pilot course is implemented and tested for good functioning and to make sure that it contains all contents requested for publication.

Contents belonging to areas other than banking are ordered from external suppliers. The person in charge of content stated that sometimes only content development is ordered outside, while the computing work is done in the bank itself. There are times when the whole process is outsourced, especially if multimedia work is required, though the bank's design criteria are taken into account. For instance, the Delegation and Negotiation courses are based on games and were developed by an outside agency.

## Course design

The literature points out that course design is a critical factor for a program's success. Participants believe that courses are well designed and the proof lies in the number of virtual courses that have been taken and completed. This is one participant's opinion:

> "I like the design of these courses very much; I find them very practical. You know ... I have taken eight or nine courses in only six months; otherwise, I could not have done so much. The school is always open and I never found a door closed."

They also state that it is easier to learn at the computer than reading a book, as concepts are distilled and well explained. Another participant commented:

> "The course comprised exactly what I had to learn. It wasn't too long, as any excess information had been omitted. It was written clearly and concisely."

Likewise, they find the course interface attractive and like it very much, even though it contains no images or sound, owing to computer equipment constraints. This is what one participant had to say on the subject:

> "I like the presentation of the courses; without the drawings, they would be very boring; the drawings help soften the computing environment."

During visits to the virtual campus, it was observed that screens are designed to attract participants through pictures, and the layout seems appropriate. The text is presented in a very orderly way and the language used is understandable and precise, with short sentences. Hannafin & Peck (1998) maintain that overloaded screens with too many different fonts can make participants lose interest. The person in charge of content explained that they have established a design criterion for screens: there should be no more than 10 lines per screen, and as many as 22 screens per course. Hence, courses are limited to six hours, which can be completed over a two-month period, with lessons taking up a maximum of 15 minutes (statistics show that participants do not usually stay on campus longer than 14 minutes at a time). Some courses of this type have been implemented recently. Currently, most of the courses have a maximum duration of 15 hours and can be completed in four months. Simulation-based courses, such as the Negotiations course, have a duration of between 40 and 100 minutes. Students comment that they prefer short courses, and also short units, so that they can acquire knowledge in a gradual and graded way, as this facilitates assimilation of the material. The content developer stated that they are considering designing courses that can be done from home (provided access is available). These courses will have more content and will include collaborative tasks. They will be of the "I want to know more about this topic" type and could last approximately 30 hours.

In visits to the campus, it was also observed that navigation design is clear and intuitive; for instance, icons are always visible in the lower part of the screen, helping participants not to get lost and ensuring that they always know where they are and are able to move forward or backward rapidly. This is very important in this type of training, as the participants study by themselves and if they do not know how to move forward or go back to a previous topic, they could lose motivation.

There are certain aspects of the design, however, that could be improved, such as color. If the screens are too dull, they may not be attractive. During the interviews, participants stated that some of the course details annoy them, such as the Delegation course, which is a simulation-based course where students are taken back to the beginning if they make a bad decision. This is a participant's opinion on this issue:

> "This course was very awkward, as I had to go back several times, each time I made a wrong decision. For instance, if I made a mistake on the third decision, I had to go back to the first one, then move on to the second, and then finally get back to the third one again."

Another inconvenience mentioned by students is that some courses do not have the option to register progress. Students are forced to browse and search for the last covered learning point, which can be time-consuming. These are a participant's words on the matter:

> "One disadvantage is that the course does not start the following session at the point covered in the previous session, so I have to look all over and go back again. After a couple of weeks you go back to the course, and you cannot remember what issue you covered last; that really undermines your motivation."

Also, titles do not always seem appropriate, which causes people to register in inappropriate courses. This is what one participant had to say:

> "There was a misunderstanding. When I registered on the Financial Markets course, which now is called Legal Aspects of the Securities Market, I thought I would be studying something more about market operations, but instead, it was oriented towards the legal side. It's not until you register that you find out what the course is about."

It is worth mentioning that the design of the courses is evolving. The first courses were very good in content but perhaps rather to long for the medium. As the technological tools have improved, contents have become shorter and more interactive, FAQs and small cases have been added, and more links are used, creating sub-documents that can be accessed.

## *The Learner*

### Personality features

From the literature review it emerged that another relevant factor affecting a participant's learning, and thus also the program's success, is the participant's personality. Hiltz (1986) maintains that if the learner is motivated, positive virtual learning can be achieved. During the interviews, it was observed that participants are very keen to get trained, and this is corroborated by the fact that they study after working hours or at times when their workload is lower. For instance, some employees who attend to customers take advantage of idle time to advance their training; customer service stops at 2:00 p.m. and lunchtime starts at 3:00 p.m. As one participant put it:

> "Working as a cashier leaves you free to access the courses after you've finished preparing the balance and storing cash at around 2:20 p.m."

Other employees take the courses between 8:00 and 9:00 a.m. and between 7:00 and 8:00 p.m. This is what the person in charge of technology stated:

> "Statistically, it is known that peak connection hours are between 8:00 and 9:00 in the morning, 2:00 and 3:00 p.m. in the afternoon, and between 7:00 and 8:00 in the evening."

This person also said that participants prefer to access courses on the first days of the week, perhaps because they are not so tired, and between the 16th and the 20th of each month, as that is when the workload is lightest.

Participants spend between three and eight hours on each course, with the exception of the simulation-based courses, which are shorter, taking less than three hours to complete. They remarked, however, that they could give more time to training if they had the possibility of doing so from home. According to one participant:

> "I spent an 'idle' afternoon I had doing a course, and then did not go back to it until two weeks later, because I did not have time. If I had the opportunity to do it at home, I would have done it before and gone into more deeply, as I consider that training complements work."

Learners also state that they register on these courses because they want to further their personal development – learn new concepts, refresh topics covered at university, or for general culture. This explains the fact that very often the courses taken are unrelated to the participants' jobs. Some register out of mere curiosity. The following is a sample of comments:

> "I registered because I don't have much in the way of Internet skills, and it's something I wanted to start to get more confident with."
>
> "These courses help me a lot at work and allow me to develop my knowledge."
>
> "I entered the campus out of mere curiosity to see what it was about, and I liked it, that's why I have taken so many courses."

Lastly, others take the on-line courses because the registration process for face-to-face courses require authorization and leave to attend them, whereas the virtual courses are free, as they give ongoing training rather than career-line courses. One participant confided:

> "I registered because I did not need any authorization and did not need to send a letter, so it was not so difficult"

## Learning process

Our literature review suggests that an individual's learning process has a bearing on the success of the program. Tutors and the person in charge of technology stated that one of the factors influencing positive learning in participants, and consequently the use of on-line learning, is the way a student learns: whether a person prefers self-study; whether he prefers to study printed materials or on-screen; whether he participates actively or not; whether he asks questions when he does not understand something, etc.

## Way of learning

Although each participant has his own study habits, certain behavior patterns can be observed. Some participants do all course activities on-screen, from reading the introduction and the text in every unit up to the self-assessment test. Others prefer to print everything out, including the test. And a third type of participants prefers to study almost everything from the screen and print the test because they need to think more to do the test. One participant made the following comment:

> "I read the screen, and on occasions I printed some pages, when I considered that they could be useful to me for other things, or to do the self-assessment exercises. I also printed the exercises, as one can think better reading from a paper than from the screen."

In case- or simulation-based courses most participants do not print anything out at all, as these courses have a different structure, although some print out the theoretical section preceding the case. This is what one of the participants told us:

> "I did not print the Delegation course because it was set as a game; it was very entertaining and not at all heavy going."

Various reasons were given for printing out on-line materials, such as that the screen tires the eyes, that students want to be able to use a highlighter, or that they like to file information in paper form in case they need to consult it later. They also said that they are not used to studying on-screen because they have always studied from printed materials, and because it is more comfortable. There is a culture of studying from books. The following is how one participant saw it:

> "It is easier for me to study from printed material than straight from the computer. It's less tiring. Perhaps future generations will be more accustomed to the computer, but I have always studied from printed material."

Others explained that they work on the courses at the weekend at home or elsewhere, and that they find printed material more portable than a computer. Yet others said that they studied on-screen because they did not know how to print. It certainly seems advisable to have a printing option in virtual courses, as there are still many participants who feel more comfortable using hard copy. It will also be good to add facilities that require participants to follow the course on-screen, such as activities to be carried out in virtual teams or that show learning elements in action through "screenshots with captions" or "flipbook".

## Interaction

Social interaction plays an important role in the learning process (Vygotsky, 1978). Technology could help facilitate interaction among players in a flexible way (Arbaugh, 2000b). The Technology and Distant Training Technology Director commented that the learning model used in the virtual campus fosters interaction; this is essential for participants' learning achievement. During

visits to the virtual campus, it was observed that interaction takes place when participants email the tutor with questions on something they have not understood or post a query in the forum.

## Interaction volume and variables that may originate it

From interviews with participants, it was deduced that interaction between participants and tutors is scarce for a variety of reasons, such as that the course is thoroughly understood, the course provides all the necessary information, or the course is either too theoretical or too basic and so does not generate any questions. Students prefer to re-read rather than ask questions; they resolve their doubts with peers who are physically closer and so do not need to use e-mail; or simply, they are not used to asking questions via e-mail or forums. They would rather use the telephone or ask someone in person. This is what one participant told us:

> "You cannot always express what you want in writing; there are questions that require a second question, so it is better to ask them over the telephone."

Other students commented that they registered on the course just to get an idea of what courses were like, and did not need to go any deeper into the subject, as it was not directly related to their jobs. Participants like getting mail from the course tutor, although they do not reply due to lack of time. One participant expressed the following opinion:

> "When the tutor noticed that I had not accessed the course for several days, she reminded me that she was available for any queries I might have, which I found very nice."

Participants also state that they do not use the discussion forums much because they do not have enough time during working hours, as they have a lot of work to do and there is no time allowed for training. They have to follow the course after working hours and they have very little time for it. Other participants say that the discussion forum is unfamiliar to them. As one participant put it:

> "I was not familiar with the system; I did not know how to access the tutor and peers. In addition, we had been given so many warning about using the Internet at the bank that I was afraid to access it and do something I wasn't supposed to."

Nevertheless, although students do not use discussion forums much, they think that forums can be a valuable support for courses aimed at managerial skills development, where opinion and debate are central. They think that for this type of courses the ideal would be a combination: provide theory through virtual learning and have face-to-face discussions. For instance, include a face-to-face module in the Negotiations course. One participant voiced the following opinion:

> "If we had done a pre-course before taking the face-to-face course, we would have had a better idea of what it was about, we would have progressed faster as we could have avoided taking about two hours to focus on it. You would focus better on the course and know better what it was about. Instead of attending the course in the morning and in the afternoon, three hours in the morning would be enough."

In this type of course, the tutor should promote interaction by setting up activities for participants. At the beginning of the course, participants should be offered an introductory module that shows them how to interact with the tutor and their peers, as well as the facilities and benefits this will bring for their learning. This is a participant's opinion on the matter:

> "In the course presentation, there is no indication or information available about the possibility of interacting with the tutor and peers."

Interaction among participants was also scarce. Participants gave the same reasons as for not addressing questions to tutors. They also said that when they have doubts they turn to the tutor rather than peers. As one person said:

> "When you have to solve a problem, you communicate with the person you think is the expert (in this case, the tutor); you do not go to someone you do not know (in this case, the peers). What you want is to have them help you solve your problems and not waste time."

There are also those who do not know how to use the forum or who do not have time for it. This is what one participant had to say:

> "You do not concentrate much on the course, as you only do it for short periods in your spare time. If you were more relaxed and had more time, you could talk with your peers or consult them. Here, everybody rushes to complete the courses."

There are also people who do not know their peers personally. One participant commented:

> "I've seen who my peers are, but as I do not know any of them personally, I did not communicate with them. Besides, I felt uncomfortable, as I was the only administrative employee, the rest were managers or directors."

From all of the above, we can conclude that the tutor would be well advised to develop teamwork activities to facilitate communication among participants. Arbaugh (2000a) maintains that participants in more interactive classrooms are more likely to have positive attitudes towards learning and feel more satisfied.

## *The Tutor*

### Professional profile

Ulrich & Greenfield (1995) suggest that the most appropriate profile for a tutor is that of a company employee. The manager in charge stated that the tutor's profile should be that of a bank employee belonging to any branch in any part of Spain. Tutors are also expected to have extensive experience working as a face-to-face or distant learning tutor. They should also be very committed to the project and firm believers in this new type of learning. Tutors do not need to be experts in the subject.

### Personality features

Another topic to emerge from the data analysis is the tutor's personality. During interviews with tutors, it was perceived that they have a positive attitude towards virtual learning, which can help participant to benefit from it. They are committed to the project, very enthusiastic, and expect this type of training to grow, as they believe that the Internet has great potential as a means of learning.

Their motivation to play the role of tutor is generally related to their personal and professional development. They like participating in training activities. They do a 2-day face-to-face course, where they learn about the virtual campus options, how to solve technical or conceptual problems (such as how to set up browsers), and training techniques (how to attract people's attention, create enthusiasm among participants, motivate them and make them feel guided).

Tutors were seen to value this course, as it makes it easier for them to adapt to this new type of learning, of which they have little experience. It is advisable that tutors have a manual containing considerations and advice on how to run courses effectively. They also have a discussion forum called the "e-trainers community", where they can exchange experiences and opinions on training or any other topic, or use it as a bulletin board. The idea is to foster a group spirit. In practice, however, it is little uses, perhaps because it has only recently been implemented. The Distance Training and Technology Unit should encourage the use of forums, for instance, by publishing articles on e-learning and stimulating debate on the topic.

## Tutor's role

Another important issue arising from the data analysis is the role the tutor plays in the virtual learning model. The tutor's role was perceived to be more that of motivator than of a traditional tutor, because he not only helps resolve doubts but also does a follow-up of participants' work. He does this by periodically reviewing their progress, analyzing the time taken to complete each session, encouraging them to finish courses successfully when they get behind, or sending them reminders of how little time is needed to complete a course. In one tutor's words:

> "My function is to follow up students' work, motivate them to complete the course, and if they do not complete the course, find out why not. For instance, I ask them, Is there anything wrong? Have you registered and then found that you don't like the course? etc. What I try to do is encourage serious training and get participants to complete the course once they have registered. I also motivate them and tell them when the session is nearly over; I also answer any queries they may have."

The tutors do a valuable job encouraging participants to finish the course. This has led to very few participants quitting courses. By way of example, only 10% of participants drop out of courses or quit. According to one tutor:

> "Out of 50 people, there may be five cases who quit or abandon a course, and that is normally due to personal problems, illness, work overload, or focus on other activities, so that they have no time for this type of training at that particular moment."

## Interaction

Interaction in the virtual classroom is an important issue. Tutors try to promote interaction in several ways; for example, at the beginning of each course they introduce themselves with a welcome message and give participants encouragement to "break the ice" and create an atmosphere of trust. One tutor's presentation went as follows:

> "I am the tutor of this course and I'm available for anything you may need, to answer any questions, or if material is missing. I'm here for you if you need to make any query."

Another example is when tutors give students notice that the due date for ending the course is near and a participant has covered only half of the course, so they send him an e-mail reminder.

## Interaction volume and the variables that can originate it

As we said earlier, there is not a great deal of interaction between participants and the tutor. According to the tutors, participants prefer to communicate personally or by phone, rather than via e-mail or the forum. That may be due to cultural factors, or because telephone communication allows for more personalized and less distant attention. However, they do read their e-mail. As one tutor told us:

> "Some participants who know me because we work together in consultancy come to me in my office or stop me in the hall to ask for help: "I'm having technical problems, my password is not accepted". For others, it is easier to phone because they say that it is more difficult for them to express exactly what they want through e-mail. This seems to be a problem of customs and culture, and it will continue until the culture of computer-based and e-mail communication becomes more widespread. Although e-mail is widely used at the Bank, people use it mainly it as a tool for work, a substitute for the fax, rather than for expressing personal opinions or uncertainties."

Other participants are unfamiliar with the system, perhaps because the "Forum" and "Who are your peers" options are relatively recent. However, the lack of a platform may cause participants to get a negative perception of the course.

### Types of questions received by tutors

Most of the questions raised by participants are asked at the beginning of the course and have to do with technical issues or the way the course works. A tutor explained:

> "From a 50-student class, you may get three e-mail messages, and almost all of them are technical questions, very few are practical; perhaps two technical questions and one practical one."

Some examples are: Is it compulsory to do the test? How do you set up the browser? I cannot access the course with the password you sent me. How can I print out pages? I cannot access the questionnaire. I've done the exercise but I cannot get the score. Why have I got this score and not the one I expected from this test?

This type of questions may indicate that participants do not interact because the contents are well explained, or because participants are too passive, or because they are subject to major time constraints.

### Resources

Another emerging issue had to do with the tutor's resources for doing his job. Time is a very scarce resource. Tutors have to do their regular job and, at the same time, they are in charge of five classrooms of up to 50 people each and have to reply to mail within 24 hours, so as to encourage communication and not discourage participants. They therefore have an overloaded agenda that gives them no time for extended interaction with students. Tutors commented that sometimes participants send an e-mail just to see whether a tutor is available, which shows that they expect a certain amount of attention.

Tutors have a space in the virtual campus for consulting general updated information about each course and each student. For instance, beginning and ending course dates, number of participants registered in a course, available vacancies in a course, names of participants, participants that have finished the course, etc. They can also get personal data from each of the participants, such as the courses they are registered in, the time spent browsing each part of the course and the grades obtained. With all this data they can conduct a satisfactory follow-up. This option was implemented three months ago; before that there were printed reports, which were less practical.

## *Technology*

### Advantages of virtual learning

The literature suggests that one of the factors influencing the use of e-learning programs is the nature of the learning environment: flexibility and learner control. Participants stated that one of the major advantages of this mode is its flexibility, as it allows them to follow the course without any commitment to fixed timetables, so that they can organize their time and use spare time to combine training and work. As one participant put it:

> "To me, flexibility is vital, one day I may connect at five in the afternoon, and another, at seven. I plan my time."

This seems consistent with the study that Arbaugh (2000a) conducted, which found that flexibility was a very important aspect of this new method of learning: do it whenever possible. However, some participants suggested that this type of learning should be delivered via the Internet and offer the same facilities as traditional distance learning. This would mean being able to print out course material at home and study in spare time; currently, courses can only be done in the workplace because the campus is only accessible via the bank's intranet. Paper support is evidently another facility that helps adapt content to the learner. One participant said:

> "The traditional distance method is more flexible because you can study from home or in the subway during your spare time; while with the other method, you have to work with the computer. It would be different if you could print it out and take it home."

One of the limitations of virtual training is that it requires a computer with an Internet connection, while face-to-face training and traditional distance training require only paper and pencil. Some participants commented that they did not have access to the Internet at home. According to one person:

> "It is impossible to do the courses from home. If I'm pressed for time at work, I have even less at home. Besides, you have to buy a computer, which costs money."

Another advantage of flexibility is that you do not need to travel from the workplace to the place where lessons are delivered. It is worth mentioning that this can save a lot of time in large cities such as Madrid, as most of the training centers are far from the city center.

Participants commented that the possibility of repeating lessons and exercises when necessary to become more familiar with the material or to go more deeply into a given topic contributes to learning. According to one participant:

> "If there is something you don't understand, you go back and do it again; if you fail on a particular lesson, or if the percentage of correct answers is low, you can easily redo (re-read) it. If you cannot remember certain definitions, you can go back and check them."

This is a very important advantage compared with face-to-face training, which demands the same pace and progress for everybody.

In addition, participants considered that this type of learning is better than traditional distance learning due to the ease of communication (e-mail rather than regular mail or telephone) and because it is less theoretical. However, comparing virtual learning with face-to-face learning, they stated a preference for the face-to-face mode because there is direct contact with the tutor and peers, because a schedule of study is imposed, and because doubts and experiences can be shared with classmates. Moreover, students can get an immediate response. In general, they consider the virtual system as a complement to face-to-face learning, and they think that, in the future, traditional distance learning will cease to exist. A participant told us:

> "Face-to-face is a little bit better because you can discuss things right away, not only your own questions but those of peers, and see possible solutions. Besides, in the virtual environment you do not see the tutor or your classmates and the relationship is more distant because the computer dehumanizes quite a lot. Face-to-face training demands more of you, there is a timetable and you have to leave everything else behind."

Another advantage of virtual learning is that it allows quick updating of content. Sometimes, when upddating is not possible for administrative reasons and tutors have to give a course that has not been updated, they send participants a summary of the main changes via the discussion forum. The person in charge of content commented that courses are revised periodically based on reports submitted by tutors, whenever they notice something out of date, or by course writers.

## Technology satisfaction

The literature shows than technological constraints can result in negative learning among participants. The Training Department people commented that, initially, when courses were first introduced, there were a few minor failures in programming, and the typical problems with the intranet, such as network failure or slow response from the servers. These problems have already been overcome and no longer represent an obstacle. Other problems persist, however, such as the lack of intranet access in some branches due to line problems, meaning that employees are unable to follow the courses. The technology chief explained:

> "In central departments, the intranet is implemented 100%. It is being extended throughout the branches. It was expected that by the end of this year all the branches would be interconnected; however, it is difficult to reach all the places due to the large number of branches we have in remote locations."

Moreover, most of the bank's computers are not multimedia capable, or else the quality is poor; this hinders the development or purchase of simulation-based courses on managerial skills. As part of the bank's general policies, not all employees have access to the Internet, so courses cannot include links to the Internet; accordingly, all documents are stored on the bank's intranet. In addition, the virtual campus cannot be accessed from home, which annoys students because many of them are used to traditional distance training. This is what a tutor had to say about this:

> "It is very important for people to have access from their homes. When I was a tutor for a distance course on statistics, I could see for myself that people did their lessons at home, even though it was not a particularly attractive course."

At present, a team made up of people from the Distance Training and Technology Unit and the Computing Department is working to provide Internet access to the virtual campus; however, this is a complicated matter for security reasons. According to the technology chief, they expect to have the system implemented this year.

Table 2 shows a summary of the factors.

**Table 2: Detailed final conceptual framework**

| **Components** | **Factors** | | |
|---|---|---|---|
| Content | Types of Contents | Structured | |
| | | | |
| | Teaching Mode | Objectivist | |
| | | Constructivist | |
| | Evaluation System | Grading | |
| | | Self-assessment exercises | |
| | | Acknowledgment policies | |
| | Course development process | Outsourcing Internal | |
| | | Workshops | |
| | | Mixed: outsourcing and internal workshops | |
| | | People involved (trainer, expert, technician) | |
| | Virtual course design | Presentation | Gaining attention |
| | | | Course Objectives |
| | | | Content presentation (hypertext, hypermedia) |
| | | Interface | Text (font type) |
| | | | Colors |
| | | | Navigation |
| | | | Sound Video |
| | | | Animation |
| | | | Number of lines per screen |

| **Components** | **Factors** | | |
|---|---|---|---|
| | | Course duration | |
| Participant | Personality | Attitude | |
| | | Motivation | Personal and professional goals and expectations |
| | Learning process | Way of learning | Study habits |
| | | Interaction – variables that may prompt interaction | Course design |
| | | | Course content (basic, complex) |
| | | | Course structure (teamwork) |
| | | | Time available |
| | | | Experience working with technology |
| | | | Course topic not appropriate for discussion |
| | | | Lack of trust in peers |
| | Advantages of this learning mode | Time and space flexibility | |
| | | Learning style and pace | |
| | | Quick content updating | |
| | | Asynchronous communication | |
| | Technology satisfaction | Technology quality | |
| | | | Reliable Poor |
| | | | Constraints |
| | | Limitations | Slow Internet connection |
| | | | Home access |
| | | | Computers with certain features |
| | | | Cost of line at home |
| | | | Intranet access from the firm |
| Tutor | Professional profile | Company executive | |
| | | Teaching experience | |
| | Personality | Attitude | Positive |
| | | | Negative |
| | | Motivation | Likes teaching |
| | | | Develops expertise while teaching |
| | | | Follows training courses |
| | | | Interaction space among tutors |
| | Role | Active | Motivating |

| Components | Factors | | |
|---|---|---|---|
| | | Passive | Answers to questions |
| | Interaction | Communication | Much |
| | | | Little |
| | | Type of questions | Technicians-technology |
| | | | Administrative |
| | | | Contents |
| | | Variables that may prompt interaction | Culture |
| | | | Desire for personal communication |
| | | | Familiarity with technological platform |
| | Resources available | Time for fulfilling role | Replies to mail within 24-hours |
| | | Technological tools | Virtual campus as space for fulfilling role |
| Technology | Advantages of this learning mode | Time and space flexibility | |
| | | Learning style and pace | |
| | | Quick content updating | |
| | | Asynchronous communication | |
| | Technology satisfaction | Technology quality | Reliable |
| | | | Poor |
| | | Constraints | Slow Internet connection |
| | | | Home access |
| | | | Computers with certain features |
| | | | Cost of home line |
| | | | Access to intranet from firm |

Finally, it is important to note that most of the interviewees stated that this program has been a success. The Technology and Distance Training Director commented that the success of virtual courses can be judged from the great number of virtual classrooms that have been created. There are more than seventy-eight virtual classrooms. Nevertheless, students have made various suggestions that have helped to keep improving the campus, such as having access to campus from home, the obviousness of some of the self-assessment exercises, adequate course labeling, need for prior marketing campaigns, prior publication of course beginning dates, etc.

# Implications, Future Research and Limitations

The results provide a detailed and closely analyzed picture of the new-technology-based training programs that are being developed to meet the bank's training needs. Although the results cannot be generalized because these courses have been studied in a specific context, they can help us understand e-learning and the factors that influence its success. Additional studies will be re-

quired to achieve a better understanding of new-technology-based training in firms. In what follows we present some recommendations.

A topic worth researching is that of evaluation systems in virtual learning. In the programs we studied, there are no formal evaluations; instead, there are self-assessment exercises that allow participants to check their understanding of the course content. In other words, learning responsibility in these courses lies with the participant. One of the reasons for this could be that these are ongoing courses that are not aimed at grading participants but at delivering certain types of knowledge and skills, which can improve the participants' work quality or professional development. Another reason could be that grading is not appropriate for mature students.

It would be interesting to study learner characteristics in a virtual environment. Our study suggests that the most successful participants are the ones who are pleased with this new way of learning and are motivated because they desire to attain personal goals.

It would be very interesting to conduct research on the tutor's role. Our study suggests a very active role, facilitating learning and motivating the learner to pursue the course in a successful way.

There are some constraints in generalizing this study to all organizations or the entire population of organizations. Firstly, the research method used focuses on the case study, which is a form of qualitative research used to gain a deeper understanding of unique situations that are part of a given context. This study cannot be generalized because of the interactions originated and the deviations produced by the researcher's subjectivity and that of other people involved in the case. Secondly, only residents of Barcelona and Madrid were interviewed, due to cost constraints, and it was perceived that some factors might not have emerged for this reason. For instance, students in remote provinces and populations may find it more valuable to have high quality technological infrastructure that makes this new way of learning feasible. Likewise, there may have been important emerging aspects of a multinational/multicultural nature, as these firms are international. Thirdly, the subject of this study is a training program belonging to a firm that trains many employees throughout Spain. It may be that different factors would emerge from smaller firms. Fourthly, the firm studied here belongs to the financial sector, which is very changeable and requires continuous innovation to remain competitive, technology being one of the key factors for such innovation. For this reason, participants may have a profile that is biased towards working with technology, given that most of their work is done via computer. Fifthly, the firm was the result of a merger, so it urgently needed to train employees that were new to the firm. This had to be done fast, throughout Spain, so the best alternative was to use e-learning. This means that, due to this special requirement, a decision was made to use this particular training mode, which may have yielded biased results, as the firm was more likely to use this method. Sixth, another important aspect is that the study was conducted at a time when virtual learning was booming, both in Spain and in the rest of the world. It is possible that participants, tutors and the project management team in particular may have been influenced by this novelty effect. Some participants commented that they sometimes boasted among their peers about how they were using the latest technological advances to develop their training. This natural predisposition may have given rise to certain deviations in the study.

Hence, before conclusions can be generalized, the model should be made more precise and should be tested in smaller firms, not resulting from mergers, belonging to other sectors, and not based in Spain.

# Conclusions

This study shows that virtual learning at the bank is evolving gradually. As this is something relatively new, the firm is learning about it as the project develops. The virtual campus is permanently under construction; both contents and platform are improved gradually as new experience is acquired.

Fourteen factors influencing the use and success of a new-technology based training program have been found. These factors have been grouped into four components: content, participant, tutor and technology.

With regard to content, it was found that structured content is easier and cheaper to implement through e-Learning. Another relevant factor is the way this type of content is taught. The emerging learning model is the objectivist model, which seems more appropriate for structured contents, as the individual can learn by memorizing. Another important factor for the success of a course is course design. It was observed that courses try to take advantage of all the facilities offered by technology, such as icons, colors, graphics and hypertext (links between contents) in order to make the contents more attractive and entertaining. The courses were also found to be well structured and relatively short, so it can be assumed that short courses are more appropriate for virtual learning than longer courses, or courses with very long sessions. It should not be forgotten that the participants' main activity is their work, which means that there are time restrictions that may prevent them from completing a long session.

With regard to participants, we found that participants' personality is an important factor for the programs' success. It was found that participants who are pleased with this new way of learning and who are motivated to achieve a personal goal will use all available means and resources to attain positive learning. That may include using after-work time for training and putting every effort into training in spite of any limitations that may be encountered.

As for the tutor, professional profile and personality are important factors that may contribute to the success of virtual learning. The emerging profile is that of an executive who belongs to the firm's staff and who therefore knows the corporate culture. It was found that tutors have a positive attitude, believe that Internet has great potential as a means of learning, and think that, in the future, the trend in training will be towards a greater use of this medium. They are also motivated because being a tutor enhances their personal and professional development. It was found that the tutor plays a key role in the virtual learning model. Not only does the tutor respond to any doubt in the course but helps participants follow the calendar effectively by motivating them. One of the main difficulties encountered in this type of learning is the workload that tutors have in order to reply to mail and discussion forums.

Regarding technology, it was observed that the advantages that participants find in this new learning mode are an important factor in to the success of the training program. Flexibility is one of the most valued benefits, as students can continue their training anywhere, without having to move from one place to another, at any time, even early on a Sunday morning at home.

Another facility that they find valuable is that they can follow the course at their own pace and learning style. Thus, they can re-read the material as many times as they like, divide course content, control objectives and contents to be covered in one day according to their time availability, etc. Lastly, participants encounter certain difficulties in this form of learning. Technological constraints, such as the limited computer capacity in branches, give rise to a negative perception of the course.

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