INTRODUCTION

Cinterfor / ILO has been developing, for some time already, its own experience in the use of New Information and Communication Technologies (NICTs) for its educational and advisory activities. It has also been observing the increasing interest of its member institutions in this subject, widely known as e-learning.

The subject is indeed spreading but it is suspected that there are still many confusing concepts in this expansion that partially explain a number of failures, huge investments that have not always produced the expected results, etc.

Cinterfor / ILO's request therefore emerges as a book that helps to guide –or at least think and revise more in depth– practices being carried out in the field.

I have resorted to three main sources to respond to this request:

- My own experience in the field, developed by educational activities held at popular organisations and by teaching at the university.
- I also include some articles and debates in national and international technical and academic forums which contain some more specific references in this work.
- Besides, the visits to four member institutions of Cinterfor / ILO were included: INA (Costa Rica), SENA (Colombia), SENAC and SENAI (Brazil).[1] These visits were short but very intense and useful; especially due to the willingness to collaborate of the teams that received us in every place (no e-contact would have been as interesting…).We picked up problems, solutions and reflections on the subject that I have tried to incorporate in this report. Furthermore, we collected many helpful examples that are used here to exemplify the different concepts that are presented.

1 Respectively: National Training Institute (INA), National Training Service (SENA), National Commercial Training Service (SENAC), National Industrial Training Service (SENAI). In the first three cases, we visited their headquarters in San Jose, Costa Rica, Bogotá and Rio de Janeiro, respectively. In the last case, we visited the Regional Department of Santa Catarina in Florianopolis.

This book is focused on two types of **addressees**:

- On the one hand, on those who manage vocational training institutions and who request information and criteria for making key decisions in this field. We refer to decisions such as setting up or expanding an e-learning line of work, reallocating resources for such purposes, organising appropriate teams in order to carry out the project, investing in technologies, etc.
- On the other hand, on those who work directly in the development of this kind of projects, who may find it interesting to gather methodological suggestions for their task when producing materials, organising courses, training teachers, etc.

The first and third part will be particularly helpful for those who manage VTIs. The second part will be more appealing for those who are in charge of developing courses and programmes. But they will also find useful the rest of the book since many times, they have to advise managers on strategic decisions to be taken and because, in any case, it is important for them to visualise the general framework in which their tasks are developed.

The book has been structured in the following way:

The **first part** begins by placing the objective of this work in the intersection between vocational training, distance learning and "new technologies" (in which the distance is not such and the newest technologies are combined with old ones). Chapter 2 covers key issues that this educational delivery method wishes to respond to: students' distance from the VTI and time availability to study. Besides, it refers to the areas to which it has tended to expand, particularly in the vocational training field.

Chapter 3 summarises the main trends that are present in nowadays pedagogical debate and the roles played by them in this particular area. Chapter 4 shows the articulation between the required disciplines and knowledge to work with: apart from the specific knowledge for every course or educational activity; pedagogical, communicational and technological knowledge are mentioned here. That is the reason why, working teams are, inevitably, interdisciplinary.

The **second part** contains mainly methodological suggestions for the development of distance learning courses with NICTs. It starts by describing the general design (Chapter 5), from the initial decision of setting up a course to the curriculum, by articulating the above-mentioned dimensions: regarding the subject, pedagogical, communicational and technological features. Some specific

details about the design of courses such as team work or assessment are discussed in Chapter 6.

Chapter 7 refers to the production of materials and the actual implementation of courses including some of the countless practical details to be taken into account. Chapter 8 focuses on the teaching competencies required for this kind of education, particularly on the role of "tutors". Chapter 9 attempts to be a guide within the NICTs' labyrinth by presenting some of the technological models consolidated so far. It also suggests an order for the decisions that have to be made at the time of investing in technologies.

Two general issues are discussed in the **third part**: Chapter 10 approaches the estimation of costs in order to achieve better results in the budgeting of courses as well as in the corresponding political decisions. Chapter 11 suggests some ideas for making decisions at initial stages and while developing distance training programmes with NICTs such as the location in the institution and the pace of development.

Throughout the text, you will find questions or suggestions of activities that have two possible uses:

- Promote the reader's reflection before or after reading some of the ideas, experiences or suggestions that are presented. I am aware that the lonely reader is not likely to answer these questions or carry out the activities; but, at least, I would like to stimulate the reading of what comes next or to encourage the reflection on what has appeared before.
- Help as a guide for collective discussions that may be held by teams of vocational training institutions on these subjects. In such case, this material would be working, in part, as those used for e-learning and distance learning in general.

Furthermore, these questions seek to suggest interesting models of questioning in educational activities of this sort (an issue specifically discussed in Chapter 6). As it may be seen, these questions do not generally have a unique or obvious answer, which, I believe, is particularly necessary in a field where there are no unique or obvious answers.

Finally, I would like to say, that although I take full responsibility of what I write and I do not intend to confer my opinion on others, I cannot omit to thank:

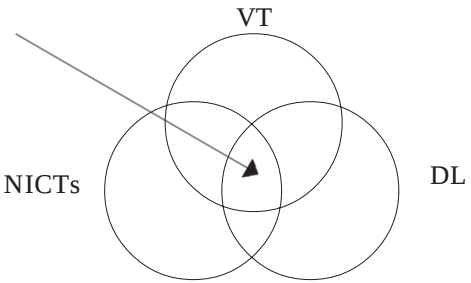
- The teams that received us at the four visited institutions.

- Rodrigo Filgueira, who apart from sharing these visits and discussing the advances in this book, contributed with the contents of Chapter 9.
- Fernando Vargas, who helped me, as well, in the revision of the advances in the book.
- The rest of Cinterfor/ILO's team who assisted me in several stages of my work during 2004.
- And particularly Pedro Daniel Weinberg, its Director, who suggested me doing this task trusting I would be able to do it…

Chapter 1

New information and communication technologies (NICTs) and distance learning in vocational training: what are we talking about?

This report is about the confluence of Distance Learning (DL) and the New Information and Communication Technologies (NICTs) –particularly the Internet– in Vocational Training (VT). The intersection could be expressed through the following graph:

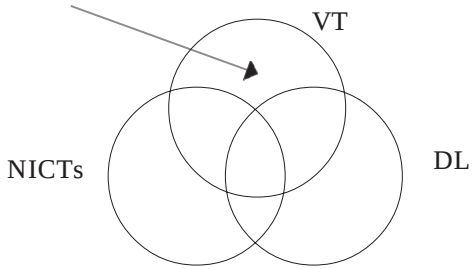


I will focus on this area because it is relatively new and because it is attracting many looks, expectations and investments. Therefore, it is an area where opportunities are increasing and, thus, where the highest risks of failures or problems are being run.

However, even marking this out, it is convenient to take into account a number of fields that are included in this intersection. And I will not avoid the reference to them in several parts of this work because these boundaries are not exact and broadening the look is, in this case, particularly useful.

We will now consider some of the examples that show the importance of paying attention to these areas which are not only “neighbours” of e-learning but are indeed part of it, since they converge in this intersection.

Thinking from the perspective of vocational training



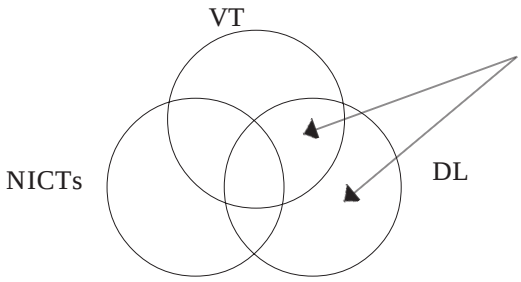
Although it may sound obvious, it is fair to highlight from the beginning that: e-learning actions are, above all, educational actions. They make sense if –and only if– they are in the framework of a clear educational strategy. In this case, they are also educational actions that aim at vocational training. This has several consequences:

- Both when planning and assessing an e-learning activity the criteria that must –or should– prevail are educational ones. Issues such as who we are training and what for, are fundamental to make decisions and they will determine if e-learning is appropriate, or not, or whether we must use one particular technology or other. If this is thought the other way round, it can lead to many failures or to apparent "success" when, for example, a large number of people attend a particular course but they were not the initial target or lack previous training that would have been necessary.
- For this reason, it becomes essential that the teams guiding these processes have sound educational and pedagogical knowledge. Technological aspects are obviously important in these programmes but they cannot be the only ones, nor the most relevant. As we will discuss later, building up the teams to work with these programmes has a crucial dimension since several kinds of different knowledge are to be combined in an appropriate way.
- Besides, in this case, we refer to specific vocational training actions. It is thus not possible to transfer mechanically successful experiences from other educational fields to this particular area. For instance, there are many vocational training areas that imply manual work which cannot be done easily far from a workshop. Although some advances have been made to this respect (simulation programmes, virtual reality, etc.) it will not always be possible or desirable to substitute the workshop with the computer screen.

- Moreover, it is not always advisable to channel "theory" through e-learning and "practice" through classroom-based actions. This separation between theory and practice is usually avoided by VTIs by integrating the classroom and workshop in the same physical space and recovering the idea that vocational knowledge is build up, above all, *through* practice. (cfr. Moura Castro, 1984; Barato, 2005).
- It is important to remember that many vocational training institutions' main target learners are populations with low access to technologies or in great need of enjoying socialisation spaces which are not easily substituted by "virtual" means.
- As we will see, some interesting alternatives are being designed but they are still key issues to be taken into account.

In what VT areas do you think it is more viable to foster e-learning projects?

Thinking from the DL perspective in general and not only from that which uses NICTs



- Since much experience has been accumulated in the DL field –and particularly in the area of vocational training– this will be very useful. Many e-learning problems are the same of "traditional" DL. For example, the production of materials, motivation, dropouts and the importance of tutoring show very similar problems both in DL using NICTs and in the "old" ways. Knowing how these problems were tackled by the "old" DL systems is extremely helpful today and the experience of those involved in it will be a very valuable contribution. Particularly, when these experiences were developed in our own institutions or –at least– in the vocational training field.

Besides, the "old" label is extremely arguable since many of these tools continue to be of great use nowadays.

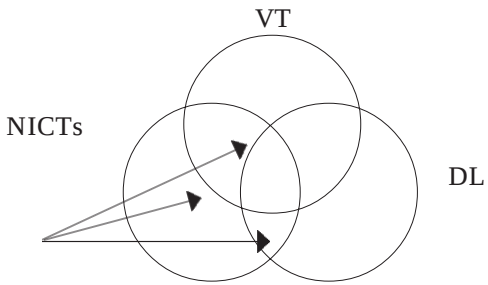
In what ways is your institution benefiting (or would benefit) from its previous experience in DL in its new e-learning programmes?

- DL is a mobile concept. In fact, DL had already evolved in the past from "total distance" to combined ways of classroom and distance learning (cfr. Bates, 1995; Moore, 1996). The same is occurring (which seems reasonable and appropriate) with e-learning (cfr. Kaplún, 2000; Bates, 2001, Giusta; 2003; Pelegrín, 2003). Because the face-to-face relationship –between teachers and students, and also among students– allows many activities that are not feasible when no such relationship exists.
- Even the term "distance" is sometimes confusing when defining many programmes. That is why other names have been used –and are still used today– for the same or similar activities: open education, self-training, self-learning (SENA, 1995; Bates, 1995; M. Kaplún, 1996; Restrepo, 2002). In all cases, the difference with traditional methods has to do with the fact that the daily face-to-face relationship among educators and learners, though not disappearing completely, has other characteristics than that of traditional classroom-based systems. On the other hand, other *educational means* (Prieto, 1991), such as educational materials, become important.
- In many classroom-based systems, many elements coming from DL experiences have been incorporated such as a more intensive and complex use of educational materials or educational means (cfr. Pedro, 2001; Contera, 2004). Some even talk about "Webisation" of education (Armellini and Grünberg, 2004), when the Internet is used as a support tool of classroom learning. There are, thus, many mixed forms that converge:

Where would you place your programmes within this line?

- The term *blended learning* is used to locate courses in the middle of the two extremes when teachers and students are requested to attend simultaneously a classroom during 25 to 75 per cent of the total academic time (Pedro, 2003). If the percentage is lower, we would be talking about distance courses; and if there is a higher percentage of attendance we would be referring to classroom training.
- These intermediate ways reveal the potentials that should be catered for, since they seem to combine the good aspects of both delivery methods and avoid many of the problems they both have.

Thinking from the perspective of information and communication technologies (ICTs) –the "new" ones, but also the "old" ones–



- There is also great experience in this field that can be extremely helpful. Many technology-based learning actions of the past will be useful nowadays and they will avoid many mistakes that are recurrent in the technology-education relationship, for example, -"putting the cart before the horse" and deciding first on the technology and then on what educational activity will be done with it (Kaplún, 2000, 2001b). There is also a lot to learn about how to produce quality material for DL: although there are specific aspects for every means or technology, many good educational materials may have a lot of things in common as well. And those sharing such experience may largely contribute now.
- There are "old" technologies that are still extremely useful, whether combined or not with NICTs in distance learning and vocational training in gen-

eral: from the book to the television, the radio or video, sound recording and the phone. In fact, many of these technologies become necessary and converge in the best e-learning or distance learning programmes of vocational training. And some things are still carried out better by the old technologies than the new ones. The book, for example, is much more comfortable for reading long texts than the computer screen. Besides, it does not seem reasonable to waste the investments already made in "old" technologies that are still working perfectly well, without being sure that the new ones can offer true advantages.

In what ways is your institution benefiting (or would benefit) from the experience with "old" technologies for the use of "new" ones?

- Furthermore, we should take into account the different NICTs of the Internet. Depending on the Internet development of every institution, it can be uncomfortable and expensive to use it for certain tasks. Instead of downloading heavy files, it may be easier to read from a multimedia CD or a DVD that allows the integration of texts, audio and video in one material at a lower reproduction cost than older technologies.
- On the other hand, a tool such as the videoconference –which is indeed converging more with the Internet nowadays– permits to get closer to the traditional "face-to-face" educational situation which may imply many advantages.
- Furthermore, it is interesting to look at the amount of technologies that are used in classroom learning actions. It may provide us with a number of clues to think about the potentialities and limits of e-learning. In the field of vocational training, some devices that simulate certain processes, or that allow to show them in a way that would not be possible in "real life", can be of great use (cfr. Mendes, 2003). For example, to see how a hydraulic pump works "in the inside" (SENAI, 1998) or to simulate the defects of a mechanic system and correct them. The development of this type of technologies can be very well used by e-learning.
- Besides, the Internet is being used as an excellent support to traditional classroom educational actions. So, we could also learn from them. Moreover, it would be interesting to revise in many cases if what is needed is strictly e-learning or if other intermediate ways would be a better option.

- Finally, it is necessary to mention something obvious: in order to benefit from e-learning it will be essential to have sound technological support. Technological problems are complex –and expensive– and they need to be catered for. There are some logical processes of the technological development that the institution should be familiar with, and benefit from, in the best possible way. For example, it would be crucial to know which technologies are more "mature" and have the largest communities of users, which are easily used by our target population and which are the costs implied, etc.

However, regarding this strictly technological aspect, it is advisable to clarify three issues:

- As it is well known, changes in this field occur extremely fast. That is why I would only suggest general criteria since, otherwise, whatever I tell you will be quickly out of date (and even some of these criteria may be out of date soon…).
- The main approach of this work will be pedagogical and not technological. In the first place, because I am not an expert on technologies and, in turn, I believe to have some knowledge and experience in the educational field in general and, particularly, in DL.
- Furthermore, I see this aspect as crucial. In my opinion, a great amount of false expectations have been created trying to find technological solutions for pedagogical problems.

Why (not) talking about e-learning?

What do you understand by "e-learning"?
Is it the same as "virtual education"?
What other terms have you heard to refer to similar issues?
Which one do you prefer and why?

Personally, I have chosen to use the term e-learning because the confluence between DL and NICTs –particularly the Internet– has largely been called this way. Or, to put it in other words, the conjunction between distance learning and telematics. And this intersection, as I have already said, is awakening increasing expectations and investments.

It is fair to remember that the term developed the same way as other "*e*": e-mail, e-commerce which refer to mail and trade that use the Internet to develop part or all their processes.

But, in my opinion, the term is problematic since it can contribute –and it already has– to confuse the problems involved in the field. On the one hand, because it can promote the tendency to focus on the technological aspect rather than on the pedagogical one.

But on the other hand, the term e-learning may imply –and there are in fact people who think so– a "different" type of learning (Pedro, 2001; Rojas, 2005).

In my point of view, such difference is not clear and, moreover, it is not necessarily linked to the "*e*" aspect of that learning. On the contrary, it has to do with decisions that are taken in the pedagogical field but that do not depend on whether technologies are used or not.

For example, (as I will discuss in Chapter 3) higher interaction among teachers and students or higher individualisation of the educational processes are not strictly linked to the "*e*" aspect and have in fact to do with pedagogical concepts and the way of organising educational actions, either in distance or classroom contexts, with or without computers. Conversely, we are observing very different uses of telematics that show learning concepts and teaching strategies that are quite the opposite (cfr. Kaplún, 2000; Gatti, 2001; Aparici, 2004).

In fact, this is what I have already said (Kaplún, 2001a): there is no "electronic learning", the same way there was no "printed learning". Computers and books are tools that can be very useful to help us to learn but the learning experience is, above all, a human activity.

Therefore, the purpose of this work is to discuss the "*non-exclusively classroom learning and telematics*" in vocational training. So, every time I say e-learning, I would be referring to this.

Chapter 2
E-learning: For whom and what for?

That is to say: Why to use non-exclusively classroom learning and telematics and who is it for? What demands or needs are being addressed?

What kind of students, situations and needs do the e-learning programmes offered at your institution intend to address?

Following this approach of understanding the subjects based on it's constitutive parts, I will start by recalling experiences in DL. Traditionally, DL has been addressed to those who have difficulties accessing educational institutions for one or both causes combined:

- **Distance** from educational institutions. Such is the case of people who live in rural areas or far from a particular educational institution which is important for their training.
  - A particular case is that of *scattered demand* which makes it difficult to physically gather a group of people. Besides, there can be a specific interest in working with people who are very distant and scattered: immigrants whose origin country wishes to assist; experts from several countries that need a very specific training; etc.
- **Time** availability. This refers specifically to students who work and therefore find it hard to attend lessons for long and/or fixed periods, but who may devote some time to personal study.
  - A different case but which usually includes those who work, is that of people who *do not want* to attend an educational institution. For example, adults who are ashamed of confessing their lack of formal training. Or people with a large experience in a particular field of work who find it

> tortuous to admit that they have not had any systematic training which now becomes necessary. Or, even graduated professionals who find it hard to acknowledge that they can continue learning…[1]

These two types of reasons –distance and time– are also a key element of the potential demand of e-learning (cfr. Machado, 2003). And, we must be careful when identifying demands and elaborating offers according to these types of reasons, the same way as when we deal with other DL experiences. We will now discuss these two aspects in more in detail.

Distance from educational institutions

The problem here would be to assess when it is more convenient to "cover" this distance with distance systems and technologies and in which case it is better to resort to the movement of students or teachers. There are two types of issues to be taken into account:

- **Pedagogical issues.** face-to-face interaction is extremely important in many cases: as a socialisation space (particularly for the younger ones), as a way of promoting learning by the dialogue among teachers and classmates, in order to acquire manual skills, to work in groups, etc. Therefore, in some cases it is convenient to plan some spaces where this interaction is possible:
  - by establishing regular meetings with the group;
  - by taking advantage of those students who live close to each other in order to form several small groups so that they can meet to study or do collective work;
  - some of the most consolidated distance learning systems have been concerned about establishing a physical network of premises and people who permits a "real" and not only "virtual" contact among students with the system, thus bridging the "distance" gap (Gallego and Alonso, 2001a).

1 This type of problems was faced, for instance, by INA, Costa Rica, in their joint work with 'Radio Nederland Training Centre' for the training of journalists. According to what was informed to us by the people in charge of the course (22 February, 2005), many acknowledged journalists did not want to take part in the forums of the courses so that no one knew they were participating in them…

But, it is also true that certain things can be done *the same way* –or even *better*– through "distance" educational means and materials than in the context of a classroom.

- For instance: transmitting information. Obviously, this should never be the only activity in an educational process. But it is clearly an important part. And sometimes, long periods of time of classroom lessons are devoted to this transmission that could be used for other activities involving interaction among teachers and students; for example, holding a discussion about a piece of information already known by everybody.
- There are debates –or moments of a debate– that can occur better at a distance than in a classroom. Having the time to reflect and write helps to elaborate one's ideas.
- It can also optimise the time of teachers when they respond to queries more slowly without having students waiting outside (although it is true that queries can multiply and teachers may find it overwhelming to have their inboxes always full…).

Due to these reasons, many classroom-based systems have incorporated some DL strategies and tools in general, and e-learning in particular.

- **Economic issues**. Even when it may be possible and convenient to carry out an activity at a distance, without any contact among teachers and students, it would be wise to assess carefully the costs implied in this option. Distance systems of quality are, in general, comparatively expensive as we will see later. Some estimation of costs should be done in order to see whether it is advisable or not to expand the educational physical network or to pay the travelling expenses of students or teachers.
  - Moreover, when dealing specifically with e-learning we should verify how much access to computers and the Internet, potential students may have. If they do not have easy access, promoting a successful e-learning system may also imply important investments or expenses to facilitate the access.
  - If "real" meetings, apart from virtual meetings, were convenient within the programme, these should be accounted for in the costs.

But it is also true that important savings can be achieved by distance work: regarding the maintenance of premises, travelling time, etc. Great *distance* or *scattered* students and a high *total amount of students* usually tip the balance in favour

of the use of technologies and educational means. (See Chapter 10 for more information).

Available time of students

Very often, it is said that students who work find many advantages in DL and in e-learning in particular. A greater flexibility in timetables is, no doubt, an appealing characteristic of DL and e-learning.

However, this idea cannot be taken as definite since it implies a lonely learner studying at home during his free time. But this is not always the case:

- Many times, the worker does not find a proper space or time to study. He arrives home extremely tired, the family demands attention, the television is on and... He finally decides to postpone it. Then, he falls behind with the course and he might eventually abandon it, as it usually occurs with distance systems that have high dropout rates (cfr. Giusta, 2003:34). It simply would have been better to attend lessons during the time he intended to study.
- If a student does not have a computer at home and must go to a cybercafe to connect to an online course, a new obstacle to cope with will be added.
- Studying on one's own is always difficult and it is not ideal. Great motivation is required. Tutorials can help this motivation, but then they should be very intense. (Some pedagogical issues from the previous part should be reviewed).

That is why many good distance systems have incorporated, for example, face-to-face tutorials. Sometimes, there are so many tutorials and they are so frequent that it is difficult to distinguish between this kind of systems and the traditional classroom system. The difference lies in tutorials carried out at adequate times for those who work and in the fact that materials and guides for students have a higher elaboration than the simple bibliography of a traditional classroom course (cfr. Gallego and Alonso, 2001b).

In fact, we could again see the issue from the opposite perspective. We should not analyse so much if a "distance" system solves the educational needs of the workers but what tools and strategies can be adopted at a classroom-based system that allows workers to study reducing face-to-face periods while improving and expanding the provision of materials for self-learning.

- The case of those who are not willing to attend an educational institution can be partly solved by distance systems. But the same issues already mentioned should be considered, as well as some others:
  - A space in which everyone feels respected and welcomed in such a way that they do not feel ashamed for what they do not know and where they can acknowledge that there is always room for improvement.
  - The possibility of anonymity for those who prefer it can be offered; for example, by using nicknames or other resources when taking part in a forum. (It is true as well that the anonymity of some of the participants can be uncomfortable for others, so full participation must always be encouraged).

But what has exactly happened with vocational training? Who and what for have DL and e-learning been developed?

Vocational training: Complementing without substituting traditional ways

For the time being, DL in general and e-learning in particular have concentrated on some specific areas of VT. These areas may enlighten us about the type of demands that VT institutions have detected. Or, at least, the kind of offer that they considered most convenient to put forward:

- *Complementary* training in mainstream subjects and competencies which may be useful and interesting for those who work in several professional areas: communication, management, languages, environment, etc.
- *Levelling* basic training: reading and writing for adults who work and cannot or do not want to attend an educational institution.
- *Updating* of very specific subjects for people who already have an important prior training and who are working.
- *Postgraduate courses*, which are usually earmarked to students who work and where there is a potential scattered demand.
- *Internal training*, for employees and particularly for teachers of the institutions, which is in fact one particular case of:
- *"Corporate"* education: tailor-made training services for workers of an enterprise.

That is to say: not only in the main or more typical VT activities but also in *complementary*, *mainstream* or *new areas*. The latter (new areas) however, cannot be generalised: some institutions prefer starting by courses which have already been experienced in classroom-based training (San Lee, 2005), which no doubt has some advantages. Therefore, instead of new issues, *new learners* are incorporated.

An exception to these trends seems to be the case of SENA (Colombia) which has recently started to work with e-learning in its traditional central areas: initial vocational training for the youth and the usual diplomas offered by its centres. But the way in which this institution has done this is actually the exception. In fact, they are mixed experiences with relevant components from classroom systems, intensive tutorials, common access rooms, etc. (And, in the convergent line already stated in Chapter 1, technological tools and educational means have been incorporated intensively in classroom-based courses such as in language courses, an area with a long history in the whole world).[2]

In fact, both in this case and in previous ones, e-learning itself was incorporated as well as other mixed delivery methods. Moreover, though there exists physical distance among educational centres, it is also frequent –and it seems advisable– that there are some reference centres where to attend classroom sessions and receive tutorials, etc. For instance, at SENAI they refer to the "capillarity of the available educational network" as a condition to develop a quality DL system.[3]

Students taking part in DL programmes –e-learning among others– represent a 5 to 10 per cent of the total amount of registered students at the visited VT institutions. In general, they were not planning to increase this proportion, at least in the short or medium term. Many programmes have been developed with new resources allocated to the institutions since this area is becoming more attractive. But, in order to keep growing, it will also be necessary to transfer resources from classroom-based to distance learning delivery methods (Bates, 2001), which does not seem so easy yet.

In turn, it seems likely that mixed methodologies (DL - face-to-face) continue growing and NICTs will play more important roles within traditional delivery methods. This, undoubtedly, can produce strong impacts in the educa-

2 These aspects were observed during our visit to SENA on 24-25 February, 2005.

3 According to what was mentioned to us by the persons in charge at SENAI-SC (Florianopolis, 16 December, 2004). Cfr. also SENAI, 2004.

tional practices and processes. These impacts can be positive or negative depending on the way the changes are implemented: higher personalisation or the opposite, higher flexibility or inflexibility, higher or lower creativity, interaction among actors, etc.

A strategy to expand the scope?

Expanding the scope is usually one of the motivations to begin e-learning activities. According to what was expressed above, this expectation can be satisfied: e-learning (or better, DL in general) can reach people that would else not have been reached –or would have been reached with great difficulty– through traditional delivery methods, mainly due to distance and time problems.

But one obstacle to overcome should be considered for this strategy to be successful: that of the "digital exclusion" of many people (cfr. Catapan, 2003; Schutz, 2003), which are usually the main addressees of vocational training institutions.

In order to face this problem, VT institutions have developed many strategies. For example:

- rooms with online computers for students' use;
- agreements with community access centres;
- payment of cybercafe hours.

Therefore, ideally these efforts should be included in broader plans of "digital inclusion" such as those of some countries, with varied approaches (cfr. Lacerda, 2004; Barbosa and Castro, 2005). Digital inclusion can actually be a cause –ancillary though not irrelevant– to work with e-learning as I will suggest later.

Furthermore, online and offline tools frequently supplement each other:

- a CD with the "heaviest" information so that it does not have to be downloaded, thus saving time and Internet connection costs.
- Printed materials, avoiding the tiredness of reading on the screen or the cost of having to print them.

Furthermore, these materials can operate as an anchor linking the student with the course. Finally, it is advisable to think again about DL methods that do neither include computers nor the Internet and are the most appropriate in some cases.

For example: in a course for taxi-drivers, printed materials (with a newspaper format) were combined with audio discs that could be heard while driving the taxi and some classroom actions. These seem adequate tools for this specific case thus expanding the scope of VT in this sector; e-learning was probably not a good idea (SENAC, 2004a).

Obviously, many of these examples have important costs. Some imply reconsidering aspects that e-learning ruled out such as classrooms and printed materials in the case of classrooms, higher costs than traditional rooms since these require Internet connection and IT equipment.

This aspect leads us to the following issue.

A strategy to reduce costs?

This aspect can be a motivation to start e-learning programmes combined with the previous one. In fact, if e-learning reduces costs, we can reach a larger scope with the same amount of resources.

This can be seen in some cases:

- When a large amount of students are geographically *scattered*, a relevant amount of travelling expenses can be saved (although some classroom-based activities are usually necessary).
- When the *scale* is too big and the same course can be given simultaneously to many students or in successive periods. This occurs frequently in basic and initial VT. Although teaching or tutorial costs are proportional to the amount of students, the scale may allow sharing the production cost of materials among a higher number of students. The increase in the scale has some restrictions in the needs to adapt to different local situations and the needs of regular updating.
- When it is possible to *do without teaching* (tutorials or any kind of method). Although it is not the most common situation, self-learning materials and programmes that do not require teaching support can be useful in some cases and for some subjects. Tutorials of IT programmes are an example. There are also good examples of administrative issues and certain mainstream competencies (cfr. M. Kaplún, 1996; Pelegrín, 2003).

One way of reducing the costs of educational institutions is saving in *printing and delivering materials*. But we should not forget that at least part of the sav-

ings of the institutions may lead to an increase in the costs that students will have to pay for, regarding the Internet connection to access materials and the ink and paper to print them (in general, of an inferior quality of professional printing). In this sense, one could argue that, more than saving this means a transfer of costs, from the institution to students and, sometimes, to teachers.

Therefore, some institutions prefer avoiding or compensating for this transfer. For example, by handing out printed materials and / or in a CD, leaving the online work mainly for the interaction between the teacher and students (cfr. SENAC, 2002b). Besides, in order to avoid that the Internet connection means a cost to the salary, some institutions pay more to e-learning teachers.

Apart from the already mentioned cases –and even in some of those with restrictions–, e-learning is not usually an adequate strategy to reduce costs. And this is mainly because:

- The production of *materials* entails much more time than lesson planning.
- In general, it is not possible to eliminate *teaching.* What happens, in fact, is that teaching roles and methodologies change. Furthermore, new teaching roles and modalities are added.
- *Technological infrastructure* is expensive and becomes obsolete very quickly.
- *Physical spaces* cannot be completely avoided: face-to-face meetings, Internet rooms and tutorial rooms may be necessary… And some of these spaces are more expensive than traditional classrooms.
- If face-to-face meetings are still needed, not all *travelling* expenses of teachers and students are saved.

All these aspects will be considered in detail in the following chapters.

Bridging the digital gap?

Although it may not be its main purpose, e-learning can be a way to attain fluent computing competencies for many people who may find it useful for their professional life and for their life in general. Nowadays, there is no human activity without NICTs playing a relevant role. And those who do not handle them at least with some fluency are in disadvantage in all social, political, economic and cultural fields.

In order to act as an “inclusion lever” for those who are excluded, a DL programme with NICTs must be supplemented with supportive actions that fa-

cilitate the access to computers, the Internet and its use. Otherwise, they may even become a new exclusion factor (cfr. Catapan, 2003; Schutz, 2003).

But we must be careful with this aspect. A student may be more motivated with the "digital inclusion" opportunity and not so much with the course itself. In this case, the student may lose interest after the novelty is over. Or, on the contrary, he may feel that the course did not meet his expectations regarding his "inclusion needs" and may also lose interest. We should not forget that the mere access does not solve the inequality and poverty gap; the digital gap is just one expression of it. Being "at the same level" of the richest in the technological field does not imply bridging this gap. Besides, the richest people do not seem so willing to use e-learning as their main educational delivery method. Although they use extensively the computer and the Internet, they seem to use them, above all, as a good supplement to other traditional methods.

E-learning supply and demand

As in many other cases, demand is somehow "pushed" or created by supply. In fact, many educational demands do not exist until specific supplies turn up because many people may not be so clear about their educational needs. In order to be more accurate, we could say that e-learning is not a "need" but a "satisfier" (Max Neef, 1986) that can solve some of the educational needs of some people: that of people who are far from educational centres, who have not got much time availability, etc. We should assess, quite accurately, which are those needs and whether e-learning actually satisfies users or not. This book intends to be a contribution in this sense.

But there are, as well, other "demands" in the "requirement" sense of the term. This is the case of some demands very strongly felt by several institutions more often today: "being updated", "not missing the boat" of NICTs, etc. Moreover, another supply looking for its demand is added: that of technology suppliers, who are obviously interested in selling their products. On the other hand, many public and private, and national and international funds seem to be available for this kind of programmes. And VTIs find it easier today to convince their financing institutions to contribute with new resources for them than for other elements that may be equally or more necessary than e-learning.

Due to this amount of complex and inter-related –educational, cultural, marketing and financial– factors, two opposite attitudes can be adopted. One, the attitude of a "technophobe", who rejects all uses of NICTs in education as a mere novelty or temporary fashion, and who considers it more harmful than beneficial. And, other, of a "technophile" who incorporates, without any critical thinking, any technologies, totally convinced that these will improve the quality of teaching and learning.

Between these two ends –and far from them– I believe it is possible to maintain a critical attitude that will try to avoid the risks, and benefit from the opportunities offered by NICTs. It will also help to distinguish between them and among all the possible ways of using them in order to effectively improve the quality of the educational supply of vocational training institutions; expanding their scope to new social sectors, and to new ages and stages of the labour life that had not been previously considered.

There are even some "side effects" of e-learning, DL and the use of NICTs in education that can be very interesting to analyse. For example: very frequently, many teachers become interested in pedagogical discussions after having technological experiences (Kaplún, 2001a and 2001b). Furthermore, as they are forced to prepare materials, many teachers elaborate some concepts that were not so clear to them and explain many things that had been out of the educational discussion, in the "black box" of the classroom or workshop (De Moura Castro, 1984).

These "side effects" remind us again that educational problems are in fact that: educational and not technological problems. Between technophobes and technophiles, it might be advisable to focus the discussion again on the educational aspect and follow an active and critical adaptation to the reality (Pichon-Rivière, 1987). An alternative way that enables to "state without being accomplices and criticising without deserting" (Santos, 1998:124).

Chapter 3

The pedagogy of DL with NICTs: Transmitting or building up knowledge?

In order to talk about the pedagogy of e-learning –or distance learning with NICTs– I believe it is essential to place the subject within the pedagogical debate in general. It is of course a complex debate that can only be approached in a partial and simplified manner here.[1] Among nowadays' educational practices it is possible to distinguish between at least three approaches:

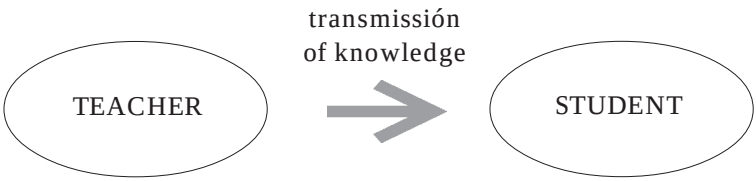
- Traditional transmission approaches, centred on contents.
- Behaviourist approaches, centred on stimuli and effects.
- Critical-dialogical approaches, centred on processes and collective construction of knowledge.

Therefore, according to their differences, there are various conceptualizations of what learning is that lead to different conceptualizations of how teaching should be done.

Traditional transmission approaches, centred on contents

The most important aspect of every activity, for these approaches, is the **transmission** of knowledge to students. That is the main task of the educator: "teaching", transmitting knowledge that the teacher knows and students ignore. The education will be better depending on the amount and quality of the knowledge provided.

1 Broader views can be found in M. Kaplún, 1998; Carretero, 1998; Huergo, 2000; Gatti, 2001; SENAC, 2002a.



Learning has to do with receiving and retaining, "assimilating" those contents in such a way to be able to reproduce the knowledge received and to put such taught skills into practice. Students are seen as recipients to be filled in with knowledge from teachers and books. Therefore, Paulo Freire (1980, 1997) talks about a "*banking*" pedagogy: the same way money is deposited in a bank, knowledge is deposited in students' brains.

In an approach such as this, **educational materials** must transmit contents in a clear and direct way, as teachers do. These materials were originally books but nowadays they can adopt various forms: videos, multimedia, etc. The traditional aspect does not have to do with the material used: the most modern means can be chosen but they are used mainly to transmit.

The typical **activities** suggested to students are *questions and exercises* proposed after the presentation of contents. The former are intended for students to revise and confirm if they remember what they have been taught, and so that they check again in case they have not fully retained or understood. The latter are used to exercise their skills. Both activities are also set out as assessment mechanisms by the teacher since they allow checking the contents that are remembered as well as the skills acquired by students. Teacher's corrections show to the students what has to be improved or what has to be re-studied.

Distance learning based on this approach implies that the transmission of knowledge is mostly transferred to educational materials. These usually contain the information of the issue to be dealt with, as well as the corresponding questions and exercises. The teacher –or *tutor*, as it is called in this case– will have to correct these activities and answer eventual doubts from the students.

The use of **NICTs** within this approach is seen as a mechanism to enable knowledge transmission, particularly regarding the production and distribution of educational materials that are handed out in CDs, uploaded to a Web site or sent by e-mail. Moreover, the materials can be changed whenever necessary, usually with a lower cost than that implied in traditional printed material. The e-

mail is in this case a good tool for students to ask questions to teachers and to receive answers from them. The teacher can also use other mechanisms such as forums in order to ask general questions to students, receive their replies and later make an individualised or collective comment, the same way the teacher would do it in a traditional classroom.

As it is seen, therefore, *incorporating NICTs does not, necessarily, imply a change in the pedagogical approach.* Any kind of tools and technologies can be used without essentially changing the approach. In fact, this is what has happened in many cases, both in traditional DL and e-learning.

Do you know any cases of this type?

The traditional pedagogical model –with several variations– is very much present in educational systems and societies, in general, up to the extent that it has established a kind of "common sense" of education that seems hard to change. However, it has received widespread criticism. Low efficacy is particularly argued: the abuse of presentation of contents as the main method results in the fact that most of what is transmitted is remembered until evaluation takes place and it is later forgotten without having great impact on the daily practice of people.

In the light of this criticism, traditional pedagogical models have found at least two different alternatives: one which could be called behaviourist and others that could be grouped under the name of constructivist. We will discuss them separately.

Behaviourist approaches, centred on stimuli and effects

Without disregarding contents, the main objective here would not be that the students remember all the information but that they are able to do what is expected from them; they will have to acquire specific skills that will allow them to act in different situations and to solve, adequately, any problem they face.

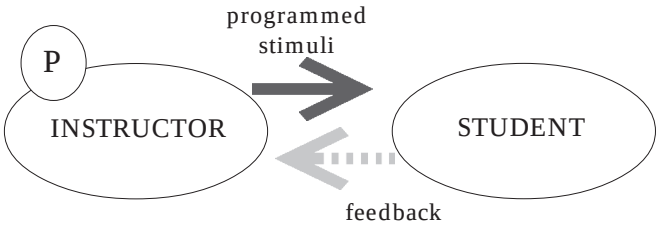
To do so, according mainly to the contributions of behaviourist psychology,[2] it is necessary to plan and ration, appropriately, positive stimuli that promote the expected behaviour. Furthermore, if necessary, negative stimuli will

2 See the works of B. F. Skinner (1970, 1985) who has been the main referent of this trend.

have to be provided in order to discourage certain behaviours which are not desirable. The student will be encouraged to *do*, to practise such skills that he or she must acquire, prioritising active methods over transmission.

An important element is the search for a continuous feedback that may check that the intended effects are being achieved and modify the contents and stimuli if this is not happening. Feedback is thus a kind of "thermostat" of educational processes which permits the regulation of the flow of knowledge and stimuli in order to achieve the expected results. A typical mechanism is that of a 'pre' and 'post test' that allows verifying the starting and ending point of every student.

In this approach it is frequent that the teacher's role adopts, at least, two more forms. On the one hand, an educational programmer is in charge of developing contents and activities, planning the appropriate stimuli and feedback forms. On the other hand, an instructor applies an already designed programme to the students.



In fact, in educational programming, there can be a team of people: an expert in contents, another expert in the design of educational activities, etc. (the names vary as well: pedagogical designer, educational engineer, etc.).

There is careful planning so that each educational objective is designed in detail and expressed in terms of behaviours: "the student will be capable of…" And for each objective, there is a specific set of tasks designed to achieve it.

Tasks are central for this method. Even when knowledge is presented, it is done in an active way: activities are always suggested so that students can apply the knowledge in concrete situations: exercises, problem-solving tasks, etc.

In order to assess the acquired knowledge, standardised and quantifiable mechanisms are frequently used such as multiple option tests in which it is possible to automatically verify correct and wrong answers.

This kind of approaches were firstly used in classroom-based activities but they were rapidly applied in self-learning and DL, for example in "programmed learning" in which a person can take a course, on his own, following a particular material –which might be printed, on audio, video or combined, etc–. The material does not only provide contents but also tasks and self-assessment tests. In DL a tutor is usually incorporated to support the student during his process. Furthermore, the tutor may intervene in the assessment stage which is, anyway, an automated multiple option test.

From the beginning this kind of approach was interested in the development of **materials** that went beyond the traditional text. Besides, it implied the use of varied **technologies** in educational processes that provided more effective stimuli for learning and made traditional teachers less necessary since they were seen as the source of many of the problems encountered in educational systems. If the contents and tasks are carefully planned and developed, they believe, many of the usual failures in education –badly prepared teachers that make unavoidable mistakes– will no longer occur. Therefore, the highest possible standardisation of educational processes is ideal since it ensures the same contents, tasks, stimuli and assessments.

This approach has been very much used in e-learning courses; it proved great as a standardisation tool of educational processes that allowed for the specialization of work: content compilers, task designers, tutors, etc.

Do you know any e-learning programme with this pedagogical approach?

This approach encountered criticism as well. For example, Gimeno Sacristán (1990) suggested that the "obsession for efficiency" has led to forget that learning is above all a *human activity that cannot be mechanised* as an industry. Careful planning of *specific objectives* of every educational task may lose sight of the actual educational *purposes*. It seems a technicist pedagogy which might be efficient for the training of skills but which *does not promote critical thinking skills.*

The strongest criticisms are probably those which suggest that, in fact, this model is not so different from the traditional one. Although it is much more efficient, it is still a "banking" pedagogy; but now of a "cash dispenser" (M. Kaplún, 1999). Although the traditional teacher is no longer the centre, there are still two poles apart: one of knowledge and one of ignorance. Learning is seen in

both cases as an **exogenous** process which always starts outside the student and goes towards him.

This aspect regarding **the concept of learning** helps to understand some of the key issues of the educational debate.

Learning as a personal and social construction

Learning can be understood, mainly, as the effect of teaching. According to this approach, the educational processes must be mainly "teaching": transmitting knowledge and/or train in skills. They refer to teaching-learning as one activity, omitting many learning processes that daily take place without any teaching action. And, on the contrary, there are many teaching activities that do not lead to learning or result too weak, not very sound or long-lasting. Students "learn" for the exam and later forget. Or they acquire a skill but not the ability to face new situations. And of course, no critical thinking skills are acquired since all that is taught must be learnt without questioning, without doubting, as if it was an established truth.

That is why we insist that the obsession to "teach" must leave some room for the concern to "help to learn". But to do so, it is necessary to be clear about what learning means and how people learn.

Much research, particularly coming from constructivist trends,[3] has emphasized that learning is, above all, an **endogenous** process; that is done by the learners themselves and that no one can do for them. It refers to an *active process of knowledge construction* that cannot be acquired passively. It is possible to reproduce memorised information or to train mechanically some skills, but it is not possible to build up sound learning that might help students to face new situations that were not previously anticipated by learning.

For some trends, learning is given mainly through *discovery*: one learns what is discovered by oneself (Piaget, 1975). Education must be, above all, an invitation to *research,* to *explore*, thus a space that encourages this exploration. Without denying this aspect, however, some state that it is possible and desirable to *guide* this exploration activity; to offer guidance that may help the learner as a "scaffolding" that may enable their own construction and that may be withdrawn

3 A good synthesis of the different constructivist perspectives can be found in Pérez Miranda and Gallego-Badillo (1996) and M. Kaplún (1996).

when learning has taken place (Bruner, 184, 1988; Pillar Grossi, 1993). In any case, it is crucial to stimulate the research and critical attitude, for instance, by showing how humanity has built up knowledge, ruling out some "truths" and constructing new ones which will always be *temporary* and *arguable* and will always be subject to revision and debate.

Some researchers hold that good teaching always goes a little beyond the learner, seeking to generate a "*zone of proximal development*" (Vygotski, 1978) that may be the link between the actual and potential development. The key role of educational processes is precisely, creating those zones of proximal development. Therefore, the interaction between the apprentice and the educator will be crucial as well as that between the apprentice and his peers since they might be in a better condition to help him than the teacher because of being closer to his situation.

From this point of view, *interactions* are key elements in the learning processes. One can learn on its own but also, and particularly, with others, in the dialogue with others and in the social environment. Therefore, working in *groups* is not only a question of money (the same teacher for many students); learning is a social process of knowledge construction. The *dialogue* with others –not only with the educator– allows us to develop our thinking which is built up with language: we think with words (Vygotski, 1979). Listening only does not allow us to build up knowledge: we need to strongly stimulate the *expression* of learners.

In order to achieve *significant* learning (Ausubel, 1987) that is relevant for the learner and, therefore, long-lasting and sound, it must be started where the learner is. It must be related to previous knowledge, sometimes to restate it and expand it; in other occasions to question it, to argue about it and to suggest new outlooks and approaches of it. But it must always *start from previous knowledge*.

Learning becomes particularly significant when the learner faces real *problems* to be solved. It does not refer to the simple exercise with educational purposes but to problems such as those faced in real life with their complexity and challenge. Problems stimulate our *desire* to learn (Pillar Grossi, 1994).

But it will also be important to *conceptualise* the strategies that might be involved to solve these problems in order to build up useful learning to face new situations or other problems. The learner will thus build up –or re-build, revise and modify– their *conceptual maps* (Driver, 1986). Both elements must be combined. Besides, handing out these tools without previously setting up a *problematic situation*, where they become necessary or desirable, may result in little significance for learners.

Finally, it is worth considering research that has shown how human beings *learn in very different ways* since there is no unique intelligence but multiple and varied intelligences (Gardner, 1983). Thus, for instance, for some people the verbal and linguistic aspects play a key role but, for others, the "bodily intelligence" is paramount. The former learn mainly through listening, speaking, reading and writing. Whereas the latter learn, above all, by touching, moving, experimenting, etc.

According to these learning concepts, it is possible to observe, at least, two new questionable issues of the behaviourist models, focused on stimuli and effect.

On the one hand, the *questioning of standardisation*: if learning is always a personal construction that must be initiated from previous knowledge of the learner, it does not seem possible to build up one unique valid programme for any group or person, without previously being acquainted with the specific situation of learners or their particular learning styles.

A solution that many behaviourist models have found is planning many possible ways for every student, in such a way that every student builds up his or her own individual path. Even if we assumed that all possible paths could be anticipated –which does not seem very easy, indeed– there is still another issue to argue about.

If learning is a social construct, group work seems essential. It is therefore not desirable to focus so much on individualised processes that end up by *isolating every learner from the rest*. This has precisely been one typical problem of DL systems that have idealised the concept of a lonely student. Every one learns at his own pace, at home, without having the need to attend an educational centre... and without interacting with the rest.

On the contrary, group work becomes a central element in learning processes with a constructivist view. This perspective is very much tuned with a third kind of pedagogical approach.

Critical-dialogical approaches, centred on processes and collective construction of knowledge

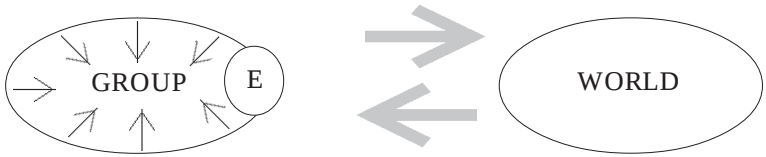
When we talk about critical approaches, we refer to them in two senses: developing a critical attitude towards reality and a critical attitude towards knowl-

edge, both to prior and new knowledge contributed by oneself and the rest (the teacher, the students).

The "dialogical" dimension has two senses as well: the dialogue among the members of the group and with the surrounding reality. It is a critical dialogue because it has to do with transforming ourselves and transforming the reality surrounding us. Educational processes must actually help us in this transformation task. They are, in fact, dialogical spaces of knowledge: teachers and learners know things that can be shared, from experience and prior knowledge, so they jointly build up a new knowledge. Therefore, the group space is crucial.

For these approaches, educational processes are, above all, precisely that: processes. The process is as important as the contents and the results. That is why the learning style will determine the way in which the members of the group develop their own learning ability and critical thinking skills. It will not be sufficient to "know" more (receive more information) nor knowing how to do things that one did not know how to do in the past. This is undoubtedly important, but the way in which they have become acquainted with such information or developed a skill is paramount: either by raising a problem or being ready to argue about the situation since there is never a universal truth nor a single way of doing things. The knowledge and "know how" is built up with others and there is critical thinking on them as well.

The role of the educator in this kind of approach will not only be of a transmitter of knowledge but mainly of a facilitator of personal and group learning processes. It will therefore contribute with information but it will do so through the knowledge of the group and problem-based activities, and confronting it continuously with the world, and the social and material environment surrounding it.



dialogue and transformation
(mutual and of the environment)

The role of educational **materials** in the context of this approach, is, in the first place, provocative, it acts as a "trigger" that helps to look into reality and share prior knowledge and concepts; it should also foster *raising problems* and

debating such reality, knowledge and concepts. For this purpose, materials that transmit new *information*, or knowledge that the group does not have, will be useful. But they will seek to present such knowledge so that it can be comprehended in a *critical way*. Educational materials will be thought to facilitate personal and group *knowledge-building* processes through activities that allow expressing, systematising and organising knowledge. They will also permit *to use* this knowledge by facing them to problems that the group may visualise in their reality. Thus, materials are not only produced by educators but also by the rest of the participants.

In **DL**, this approach implies a strong emphasis on the group. In some cases, it will only be one group, in some others, subgroups will be formed within a larger group. For example, people that live close or that share similar interests or problems may get together. Every group will have as the main reference, this shared reality that will be subject of analysis with the contributions of the rest of the group and the new information provided by the teacher, for instance, by developing a work project in their area. Face-to-face meetings will be organised as long as it is possible since they are very useful for forming and consolidating groups, as we have already seen. Although there will be a general design of a suggested schedule, it must be open to new possibilities. And it must also be capable of strongly incorporating the contributions of the participants.

The inclusion of NICTs into this approach prioritises the dialogical potentials of them. Apart from using them as tools to transmit information, they are used to share knowledge and to build it up collectively. All participants –and not only the teacher– will contribute with their own materials. Journals, parallel texts, individual or group portfolios can be some of the tools to encourage this. These will be enriching tools to assess; they will not only include the results obtained by each person or group but also the processes gone through. Forums and e-mails will not only be a tool to ask questions to the teacher or to evaluate the student but also to foster the dialogue among participants. Furthermore, the production of each sub-group or working team can be very enriching to share and this is very often done not only through distance learning courses but also in classroom-based activities.

As may be noticed, it does not seem possible, nor desirable, to seek a great *standardisation* of educational processes in an approach such as this. The processes should be able to consider the characteristics of every group, previous knowledge of learners, their specific interests and needs and the contexts in which

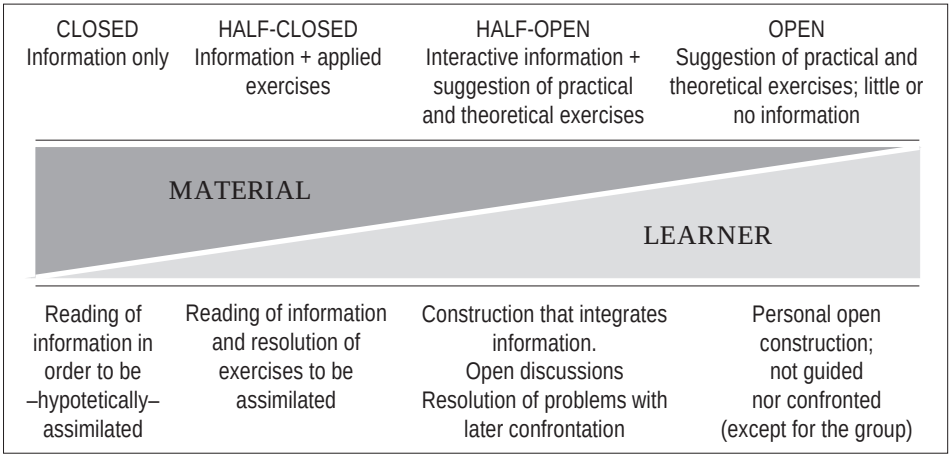
they live and interact. And, of course, these aspects vary from place to place and change with time.

In order to achieve this variety, it will be essential to have a prior knowledge of the contexts, interests and needs of learners. Feedback will therefore not be enough: *pre-feedback* will be necessary; which implies a more profound knowledge of the learner as well as an ongoing openness of the teacher to listen to him or her, throughout the educational process. According to an old saying "in order to teach Latin to Peter, one must know Latin and know Peter". We will discuss this aspect again when referring to the process of material production and educational actions.

Materials and technologies from a critical and constructivist perspective

The rejection of total standardisation in the critical-constructivist perspective does not imply that no elements are repeated in the different educational processes. But there will also be many differing elements. In order to achieve this balance between what is *steady* and what is *variable* among different educational processes, materials are usually *half-open* in this approach. In order to fully understand this concept, have a look at the following chart where the degree of openness of a material designed for DL is located in a continuum.

The *continuum* of educational materials[4]



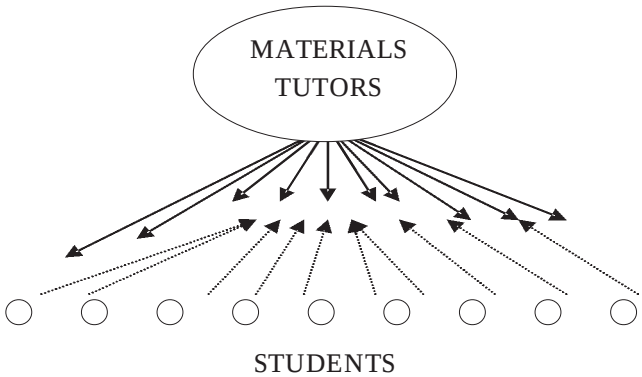
4 Taken from Kaplún, M. (1996).

The degree of closeness or openness of materials is usually connected with the pedagogical approach that supports, explicitly or implicitly, the design of a course or an educational activity.

In which pedagogical approach would closed materials be more appropriate? And half-closed materials?

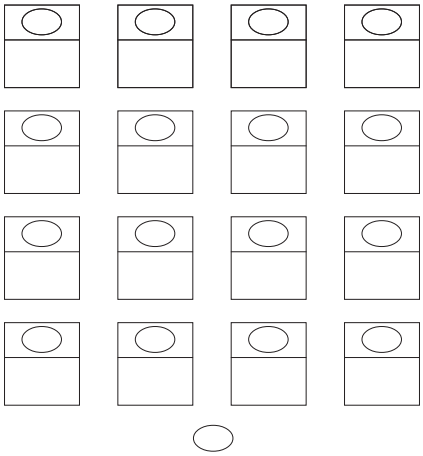
The degree of openness of a material and the kind of activity carried out by learners does not depend so much on the technology used but on the pedagogical approach. As we can see in the table on the following page, the same technology can be used in very different approaches and different technologies can be used in one particular approach.

It is interesting to see the kind of interactions generated in every case. Interactions on the left column could be represented through the following chart where materials transmit knowledge and students act according to the suggestion, and asking tutors when they need it.



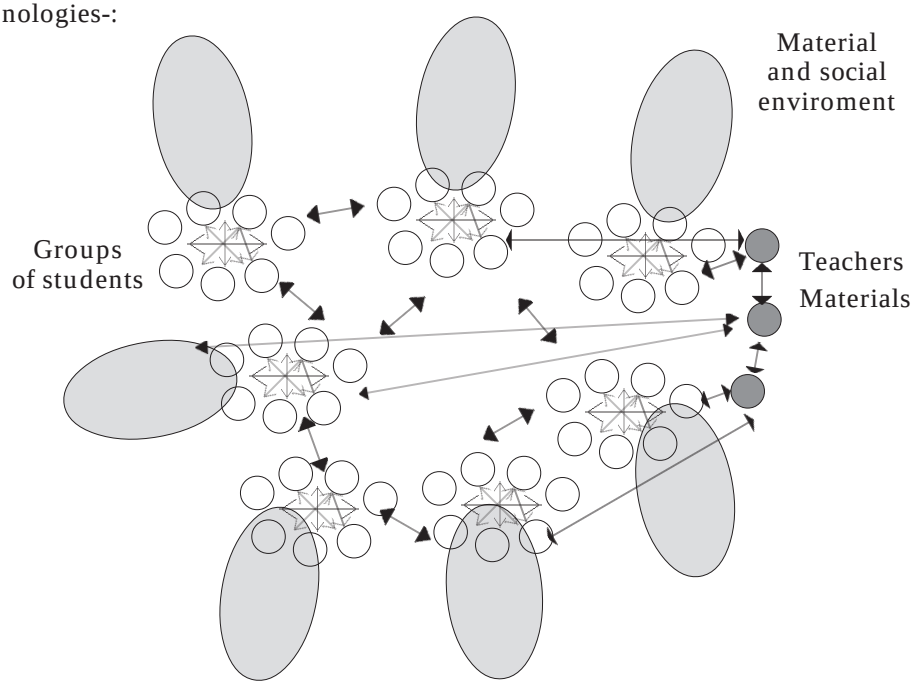
This outline is not very different from that of a traditional classroom in which students listen and see the teacher and, at the same time, the teacher listens and sees all the students. But as it is not planned that students interact among them, students only see the nape of their classmates. Fixed desks where the desk is actually joined to the seat of the student in front (Castro, 1966), and front seating arrangement (Schiefelbein, 1995) are frequent in these kinds of interactions that are focused on the teacher and the contents he transmits.

	PEDAGOGY	
TECHNOLOGIES	Traditional and behaviourist pedagogies	Critical-constructivist pedagogies
"Old technologies"	• Students receive printed material. • They take a pre-test. • Everybody studies the material and does the indicated exercises. • They do a self-evaluation test in order to confirm their learning. • If they have doubts they ask the tutor either over the phone or personally. • They take tests that are assessed by a team of teachers (in general, in order to guarantee identity, students have to attend a classroom).	• Initial, intermediate and final classroom-based day. • Students receive printed material and meet to work in groups. They ask over the phone in case of doubts. • Every group shares their knowledge and their own reality according to the suggestions of the material. • They send their production to the team of teachers that makes comments and adds new elements. • Individual and collective actions are suggested to transform their reality and practice. • Individual and group evaluation; of teachers and students; results, processes and further impacts on their practice and reality.
NICTs	• Students receive their material through e-mail or download it from a Web site or read it online. • They take a pre-test. • They study the material and do exercises. • They take self-evaluation tests and see their results automatically. • When they have doubts they ask the tutor by e-mail or online services. • They take part in forums or chats according to the subjects suggested by the tutor and/or on any subject. • They take classroom-based or online tests and are assessed by the team of teachers.	• Initial, intermediate and final classroom-based day. • Students receive their material through e-mail or download it from a Web site or read it online. • Every group shares their knowledge and their own reality according to the suggestions of the material. They ask questions through e-mail or online services. • They send their production to the team of teachers and other mates and receive comments and new elements from both of them. • Groups and persons share knowledge and opinions through forums or chats. • Individual and group evaluation; of teachers and students; of results, processes and further impacts on their practice and reality.



Although in the first chart this physical arrangement seems to be broken, the kind of basic interactions does not change much.

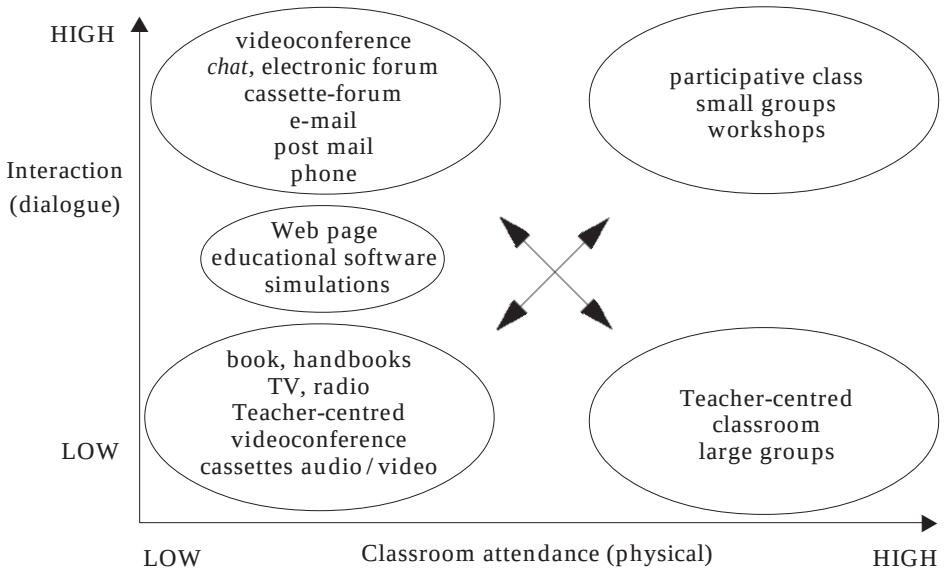
If we come back to the chart of pedagogies and technologies we could try to represent the type of interactions on the right column in the following way -which can represent both face-to-face and distance situations, using several technologies-:



In this case, there are strong interactions among students of every group and of every group with the social environment. Groups can interact among them. Teachers interact with their students and among each others.

One could object that in the first case, forums or chats also allow an interaction among students. This is true. However, it could happen that these are used as an assessment space where the tutor asks a question and students must answer (as it is the case in a traditional classroom). Or, also as a free space where the teacher does not intervene (as it occurs in "small groups" or "breaks" in the traditional classroom). This kind of interaction among students will therefore not change the concept of the teacher as a centre, as the only possessor of knowledge and power within the educational process. Students can say whatever they feel like in the corridors but this will not exert an influence on the educational process.

Nonetheless, it is true that there are certain "technologies" that facilitate more interaction than others. And this does not depend on the issue of attending a class. One can be together with others without having much interaction. And you can be far away and interact a lot. The following chart shows how different technologies allow to combine interaction with a face-to-face situation.



But, as we can see in the chart of technologies and pedagogies, the tools by themselves do not guarantee how they will be used. Besides, one can be part of a small group where there is no real interaction and where the same that occurs in a "teacher-centred" massive lesson is reproduced.[5] And forums and chats can also be used in traditional situations where little dialogue takes place.

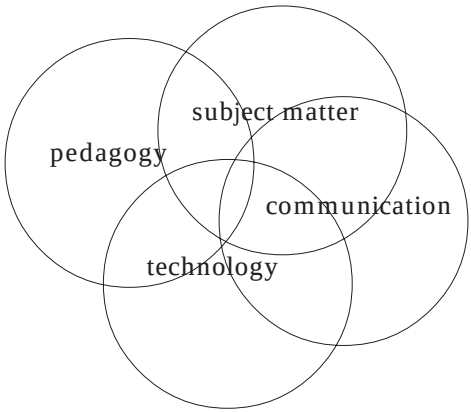
NICTs turned out as a great promise in this sense. They offered the possibility of interaction, which means a lot more than the "interactive" aspect referred to by many authors (cfr. M. Kaplún, 1999; Lacerda, 2005). But taking good advantage of this possibility in educational processes depends, above all, on the pedagogical approach that we support.

5 It seems more accurate to refer to a "lecture lesson" and not a teacher-centred one. Furthermore, according to Litwin (1997) there is a great variety of teacher-centred lessons that show very different teaching layouts.

Chapter 4

Building up interdisciplinary teams: (the three musketeers... or are they four?)

Working through DL with NICTs implies combining several kinds of knowledge. There is no one and only possible combination but, in my opinion, there are always four areas of knowledge and experience that should be present: the subject matter, pedagogical, communicational and technological features. E-learning is a typical field of multidisciplinary convergence in which it is necessary to work among different disciplines as much as possible.



What may the absence of any of these areas imply?
What other areas can be necessary?

One way of answering the first question is determining what each area contributes with.[1]

1 I have tackled this issue more extensively in other books (Kaplún, 1996, 2001, 2004).

The four basic areas

Pedagogy. The people involved may have, or not, a degree in this area; but it seems essential to count on persons with large educational experience and with a great creativity and openness to work with innovative criteria. The ideal situation would be that those having pedagogical competencies have had training and experience on DL and the use of NICTs in education. If we do not count on people with this kind of experience, it would be advisable to look for educators who are ready to get trained and, above all, to learn by working in a team with others. The best scenario would be that specific training opportunities already exist or can be generated. Otherwise, people would have to learn through team work.

In fact, the whole team should have or build up pedagogical abilities. But, in any case, the abilities would be crucial in three aspects:

- the general design of the course, module or educational activity;
- the production and/or revision of support materials;
- direct work with students (teaching, tutorials, etc.).

These tasks can be carried out by the same or different persons but all of them need pedagogical competencies. Coming back to the old saying, we could say that to teach Latin to Peter, one must know Latin, know Peter... and know how to teach.

But of course: we must know Latin. We will now discuss such aspect.

Subject matter. As in all educational activities, we should be acquainted with the subject matter. Furthermore, it would be ideal that apart from knowing about the subject the person has pedagogical skills, such as many of the teachers that work at vocational training institutions.

However, it is true that this is an interesting opportunity to include in the team other experts that may not necessarily have pedagogical experience but know a lot about a particular subject. Because, as teachers will work in a team it would be possible to take advantage of such knowledge and make up for the pedagogical deficiencies with other members.

We can therefore include statements, conferences or texts of some experts that will only take that part in the work. But we will also need to incorporate subject matter knowledge in the course and materials design, teaching or tutorials. Ideally we would need experts on the subject for all these stages. If this was not possible, other members of the team will have to learn a lot about it.

Better than knowing Latin and knowing how to teach is *to know how to teach Latin*. Although a pedagogical expert may be able to know his way around in several subjects, a specific teaching technique and accumulated experience on the teaching of the subject or discipline can be of great use for a task such as this. But an expert on Latin is not easily an expert on teaching. Therefore, the "content compiler" –as some people call it– would ideally be integrated in team work and become acquainted with the pedagogical issues involved when performing an activity such as this.

Communication. Incorporating this dimension will be useful in a number of aspects. In the first place, in order to "know Peter"; and to know the codes he uses to communicate. If no connection with those codes is established, it may be very unlikely to enter into a good communication with him. Therefore, its contribution will be extremely beneficial at the beginning of the process in order to research and analyse the demand and design of the course with the rest of the team.

This dimension must be considered too when preparing materials. In DL the effort to communicate in this case can be greater, and above all, different from what educators are used to because it is usually a *mediated* communication, where a face-to-face relationship does not always occur. Communicators usually have more experience on this area.

Communicators may help to think about the different ways to communicate among the participants of the course, the different spaces and tools to be suggested: groups, forums, lists, etc.

Their contribution will be useful as well to plan and produce advertising of the course; although it might be necessary to hire specific services in some cases.

Some technical areas will have to be incorporated when producing materials, as well as specific communicational competencies such as graphic design, sound or audiovisual production.

Some of these tasks –particularly those mentioned first– are very closely related to those carried out by the teacher. In fact, in the last years the so-called "educommunication" has been developed combining knowledge and competencies coming from both fields (Soares, 2002, 2004).

But it is hard for a communicator to be an expert in all the means that can be necessary at a complex production. Therefore, it is possible to incorporate other experts such as graphic designers that will have to be trained specifically in Web

site design. If there are many materials on video, experts on this area will also be necessary.

Anyway, although a good communicator may not be able to manage all the means by himself, he will probably have a basic training that will allow him to coordinate the work with other experts (that may not necessarily be part of the regular team) and with the rest of the team.

Technology. NICTs competencies such as those shared by computer engineers or other people trained or having experience in this area will be essential. As in the previous cases, it would be ideal that they have experience or pedagogical expertise and / or have worked in DL.

While designing the course, they will make their contributions by showing the possibilities and boundaries, the type of materials that can be used as well as communication tools, etc. They will have to give advice on the purchase of new equipment or any computer applications for the already existing one: what platform should be used, what servers will be necessary to bear certain volume of users, etc.

Some specific programming tasks will probably have to be carried out by them. Even when buying ready-made products, they will usually have to be adapted. In some cases, these adaptations can be done only by the supplier but in other cases, some other people can work on them (when they are open source).

We will also need their support during the course in order to ensure that everything is working correctly and to solve any problem that may come up. Servers that are "down" or busy, "broken" links, virus, etc. can make the educational experience at a distance a real torture for teachers and students...

I have already mentioned other areas that require technological expertise such as design, Web programming and multimedia. Although they may not be engineers, there are technological competencies that are necessary.

Furthermore, other "older" technologies must be managed such as video or sound, that nowadays have developed towards NICTs since technical operations have been digitalised. Therefore, it seems absolutely necessary to count on with experts on the area.

An ideal permanent team would thus include experts on education, communication and technology. Besides, for every course, an expert on the subject matter will also be essential. These are our three musketeers… who are actually four.

An ideal team?

As you can see, embarking in an activity such as this requires complex teams. But there is not a single possible integration. I have seen –and personally worked in– several different teams regarding their integration and size. This depends on the available resources, on the experience and abilities of the persons that are part of the teams, on the type of courses to be implemented, on the complexity of materials, etc.

The different areas are more or less present but this does not necessarily mean that there is one person or team for every one of them. One person or team can be in charge of more than one area (for example, education and communication) or one area can involve many teams or people (particularly the pedagogical area).

For instance, while working for Cinterfor/ILO in 2004, I was in charge of helping with the implementation of an educational activity using NICTs: Programme on Quality and Equity in Vocational Training. This was a specific "course"[2] : Cinterfor/ILO does not continuously develop this kind of activities. The Programme was implemented by people from the permanent staff of Cinterfor/ILO who is usually in charge of other tasks but who added this programme to their agenda, though they hired new members: "educommunicators" with experience on DL.

The team that worked for this programme included the following members:

- Experts on the subject and in charge of tutorials
- Experts on communication and education
- Experts on IT
- Secretary

For each of these profiles or competency areas there were two people in charge; and at certain points more people were included, for example to assist in tutorials. Strictly, the team could have been smaller. The fact that there were two persons in each area had mainly to do with the volume of work to be carried out

2 In fact, it was not a course in the traditional sense of the term but a systematic revision process of VTI practices carried out together by a team of Cinterfor/ILO. More information can be found on: www.cinterfor.org.uy/public/spanish/region/ampro/cinterfor/temas/gender/eventos/cal_equ/pre.htm

and the little time available.[3] That is to say, four full-time people would eventually have been enough to take up all the work.

We will now see in detail the main tasks of each member of the team.

Experts on the subject and in charge of tutorials

- general design of the course
- announcement and selection of participants
- discussions and adjustment of guides
- selection and preparation of reading tasks
- tutorials

Experts on communication and education

- general design of the course
- assistance in the announcement and selection of participants
- preparation of guides
- suggestions for reading tasks
- suggestions for tutorials

Experts on IT

- initial design of the platform of the programme
- extension and adjustment of platform
- maintenance

Secretary

- notices to participants
- uploading of materials into the platform
- register of participants and materials

As you can see some tasks are shared by experts on the subject and "educommunicators". In particular, the general design of the course was a collective task. There are other activities in which one of these poles has more responsibility and the other supports and vice versa. For instance, the course guides that suggested activities to be done by the participants were one of the main responsibilities of educommunicators, though the reading tasks were basically a responsibility of the experts on the subject. But in both cases, collective discussions according to a general design of the programme agreed by all were carried out to determine these aspects.

3 Preparation activities for launching the project were carried out in three months. In comparative terms, this is little time as we will see in Chapter 7.

Graphic design was, partly, done by the communicators –who, in fact, were not experts on design– and by the permanent staff of Cinterfor / ILO. Apparently, this area was not correctly handled. Some difficulties were encountered in the IT area, probably due to the fact that a "craft" platform was chosen and there was not a real integration among the different services provided (databases, lists, forums, etc.). Thus the problem here was not related to the people's competencies but to the technological option which in fact overloaded people with work.

We will now see another example of an institution that is continuously offering distance learning courses with NICTs and which has permanent staff devoted to them.[4]

- course coordinator*
- author(s)*
- pedagogical reviewer(s)
- spelling and style proof-reader
- designer and illustrator
- person in charge of "uploading" materials
- tutors*
- registry office
- secretary and administration

Those indicated with an asterisk vary for every course; the rest of the people are part of the permanent staff.

What differences do you see between the structure of this team and the previous one?
What do you think the causes are?

In this last team, the *pedagogical* area was located in three places: with the pedagogical reviewer, the coordinator and the tutors. Besides, the last two have a vast knowledge of the subject matter. The general pedagogical design is in charge mainly of the coordinator who indeed has a determining role in order to avoid the fragmentation of the team since he is the only one who is in contact with the rest of the team and the whole process.

4 This information was taken from Auñón (2000) and it describes the case of distance learning courses offered by the University of Barcelona.

The *subject matter* area is mainly a responsibility of the author or authors who act here as "content compilers" who prepare materials but do not perform direct teaching (tutorials).

As you can see, in this case they are particularly interested in the *graphic* area since there is a designer and an illustrator. It is usually thought that one person can do both tasks, but this is in fact not that frequent (I will discuss this issue again in Chapter 7).

The secretary, registry and administrative office also provide great support, similar to that provided to a classroom-based programme. In fact, this is the "fifth musketeer" who although is not usually in the initial diagram of areas can never be absent at work: the essential **administrative support**. For example, for students' enrolment, attendance, delivery of notices, collection of enrolment fees if applicable, etc. Although many of these tasks can be automated, human support will always be necessary.

In turn, the *technological* area does not seem to play an important role. This may be due to two reasons: that the institution has a general technological support and that ready-made solutions have been bought including their own technical support. Some of these aspects could be explained so that their relevance is not neglected.

The communication area is not mentioned except for the graphic design. It also appears in very specific cases such as video production. In my opinion, this is a narrow view of communication that reduces it to media production (and in fact limits certain media and aspects of such production).

In some of the vocational institutions that we visited, the "journalist" [5] or "scriptwriter –depending on the case– is incorporated to the team when the "content" has already been prepared by the "content compiler". The idea that a communicator translates already elaborated contents into sound or audiovisual format may cause, according to my view, some avoidable problems. In the following chapter we will further discuss the importance of including this communicational dimension since the very beginning.

But these fragmentations do not only take place in this case.

5 Cfr. SENAC, 2004i). The use of this term can be explained because many universities or schools of communication were originally journalist training centres. Although the training options later increased, the name was maintained or at least remained in everyday language in several countries.

Chain or team?

There are some stages in the production of a course where certain competencies are required more than others. It is therefore possible to think of an "assembly line-like work" where the "content compiler" prepares the contents, the teacher "turns it into" a course, the communicator finds an appealing shape for it, the graphic designer does his job, then the engineer performs his task, etc.

In my opinion, this way of working misses the chance of articulating the different types of knowledge and it has several risks. For example, it may be the case –and usually is– that the "content compiler" hands in a huge material which in spite of being very good as an academic text is far from being legible or usable at a course. The effort of the teacher will therefore be huge as well. If the teacher himself is not an expert on the subject, he may probably end up "losing track" in the material without knowing which sections are essential and which are not as important. And, while doing the necessary selection, he may rule out things that the content compiler considers crucial. If they had worked together from the beginning these problems would have been avoided.

The same may happen with other areas. For example: if the engineer only comes up at the end, it may be the case that the materials designed do not work properly in the available platform. Or that options that would have been useful were not considered: videos that would have helped understanding a particular aspect, communication tools that would have facilitated the dialogue between teachers and students, etc.

Since it is not possible, nor desirable, that all the people involved are always together, key moments or aspects should be determined in order to work on them together. As we will see in the following chapter, one of those key moments is that of general design. It is a stage when it is important that the team meets and thinks collectively. And if the team is too large, it will be necessary that at least the four areas already mentioned are present when discussing the general design.

When else will it be advisable to work together?

A frequent practice in DL is the division in the "assembly line" between those who "*produce*" the course and those who "*execute*" it, such as tutors. This division is sometimes inevitable, particularly in the case of large experiences. But for those who are in charge of "executing" the course, it can be a little demotivating to take

up that role if they have few chances to contribute with their experience and pedagogical abilities. Moreover, they may feel that what others designed is far from the actual context of students or teaching activity, that the material is rigid and that it does not adapt to the needs of educational processes, etc.

In Chapter 8, I will show some of the things that can be done to avoid or reduce this division between authors and tutors by involving authors in tutorials and tutors in the design and authorship. Furthermore, in Chapter 7 I will refer to the systems of progressive production in which a great part of the materials is produced while the course is being implemented, in constant dialogue with students and tutors, therefore allowing for a better adaptation to the students' context and specific educational processes.

In such an intricate work which incorporates so many contributions, the **coordination** task will be a key issue. Coordination is necessary both in strategic aspects (so that the general sense of direction is not lost) as well as in operational aspects (so that the different tasks are done properly and in time). Although, in principle, any member of the team could play this role according to his or her management skills, I think it is crucial that the person taking up this responsibility has a broad experience and capacity particularly in the pedagogical area.

One could think that given the technological component, the experts on this area should be the ones in charge of leading the group. This may emphasise the tendency to think DL programmes with NICTs from a technological perspective, neglecting the pedagogical core of educational processes. Besides, this can result in designing these processes according to technological decisions instead of educational ones. Thus, for example, a platform is chosen and then, when deciding what to do with it, the team may discover that it is not appropriate for some of the things that they want to do. Or, they decide that the course will be "fully done through the Internet" without considering the importance of classroom-based activities. Or, they mention the constructivist approach but in practice they adopt the behaviourist approach according to which many educational programmes have been built up. (It is fair to say that many of these things, which I have actually seen in practice, are not always caused by experts on technologies but by teachers dazzled by technologies that they do not really know...)

What criteria do you use -or would you use- in your institution to appoint a coordinator for a DL course?
What about a coordinator for the permanent staff who works with several courses?

Outsourcing, what and how much?

In the light of the complexity of the tasks to be faced and the teams that have to be put together, some institutions opt for outsourcing their DL programmes with NICTs or at least some of the tasks. For example: production of materials, technological development or support, etc.[6]

This can also be seen as a transition stage while the institution can learn and better assess the possibilities and eventual problems that the implementation of an e-learning –or similar– programme may bring up. It would be a kind of "*leasing* of knowledge and experience", to later incorporate plant staff and the institution's own equipment.

If it is a permanent outsourcing, it will be essential to clarify which areas the institution would still be in charge of; as in any other outsourcing. Most probably, the pedagogy and the subject may be in this situation, since they are key elements in a vocational training institution (VTI).

In order to decide between one option and the other, the institution will have to assess the resources it may already have. For example, if they already have people with communicational and technological abilities, it may be reasonable to benefit from them; otherwise, it would be better to hire them outside.

In any case, if they opt for outsourcing the whole or part of the job, it is fundamental to agree straightaway on the means and transfer that the outsourcer will provide in order to avoid misunderstandings and an undesirable dependence. For example, setting trial periods in which mistakes are corrected, training if necessary, delivery of source code, clear agreements about copyright, if applicable. Both in tender calls, as well as in contracts, institutions must be extremely careful.[7]

The same occurs in the case of "*leasing*" regarding staff training and institutional learning. It is crucial to ensure that the institution is actually enabled to continue on its own after some time with the least possible dependence from the original supplier.

In fact, a degree of outsourcing will almost certainly be inevitable. For instance, if they have not got their own video production equipment it is very

6 This is the case of INA, Costa Rica, which outsources some of the tasks. In the case of SENCE, Chile, they have outsourced all courses, keeping control only over the activities.

7 For example, the contract announcements used by INA, Costa Rica, anticipate in detail all these aspects.

likely that buying it may not be a convenient decision, if it is not going to be used extensively. A difficult aspect, which I will further discuss in Chapter 9, is that of platforms and servers.

Another issue is that of **service contracts** for programmes or courses: for "content compilers", communicators, tutors, engineers, etc. This will again depend on the abilities already present in the institution and the steadiness of the task to be developed. In my opinion, a vocational training institution may never lose track of the pedagogical leadership of the process.

For example, it seems reasonable to enter into a service contract with some highly specialised experts on the subject matter. But it does not seem logical to permanently hire a teacher with experience on DL if the idea is to continue working in the long-term, instead of hiring him for a pilot or concrete action.

A difficult case is that of tutoring. Hiring people to carry it out may optimise resources by adjusting them to the number of enrolled students in each course. But, at the same time, the institution must ensure the high quality of tutors –a key element for a good course– and this may be lost if the staff varies constantly. An interesting option may be resorting to teachers that are already working in the institution in classroom-based courses and who may therefore devote their time to this task with an adequate prior training and continuous updating. In this case, the institution will have to take into account that the salary levels will have to be higher than the rest if teachers are requested to have their own equipment and if they have to pay for their Internet connection.

Which areas could your institution outsource? Which not?

Chapter 5
Designing a course: The four musketeers in action

The initial decision

There are many possible ways to come up with the decision of carrying out a distance course with NICTs. An already consolidated team or programme that has to decide which course should be launched will be in a very different situation than that of an institution which is starting up its activities and which must decide whether it *must* or must not carry out any course.

In any case, there is a key issue that should be the starting point: the needs and demands. Agreeing on an "**educational need**" and detecting educational demands is always extremely difficult, both for classroom-based courses and distance learning and either using NICTs or not.

In the vocational training field, issues such as labour and employment forecasts as well as demanded specific or mainstream competencies will be taken into account. These are of course difficult issues, which are frequently also controversial. Although I would not like to engage in a debate on how these needs are finally agreed on,[1] I would like to highlight an aspect which, from my point of view, is crucial in a pedagogical approach such as this one. I refer to the fact that in this kind of agreements it is necessary to incorporate, in some way, the opinion of potential learners.

This can sometimes be done in a direct way, for example, by integrating one of them into the production process, particularly at key decision-making stages such as the initial one. When this is not possible, some query methods or even more comprehensive research will have to be implemented. Discussing the view

1 For further information, see, for example, INEM, 2003; Vargas, 2004; Catalano *et al.*, 2004.

of potential learners with experts will therefore be a key issue (cfr. Kaplún, 1996, 2001).

Regarding the **demand**, there are at least four possible scenarios:

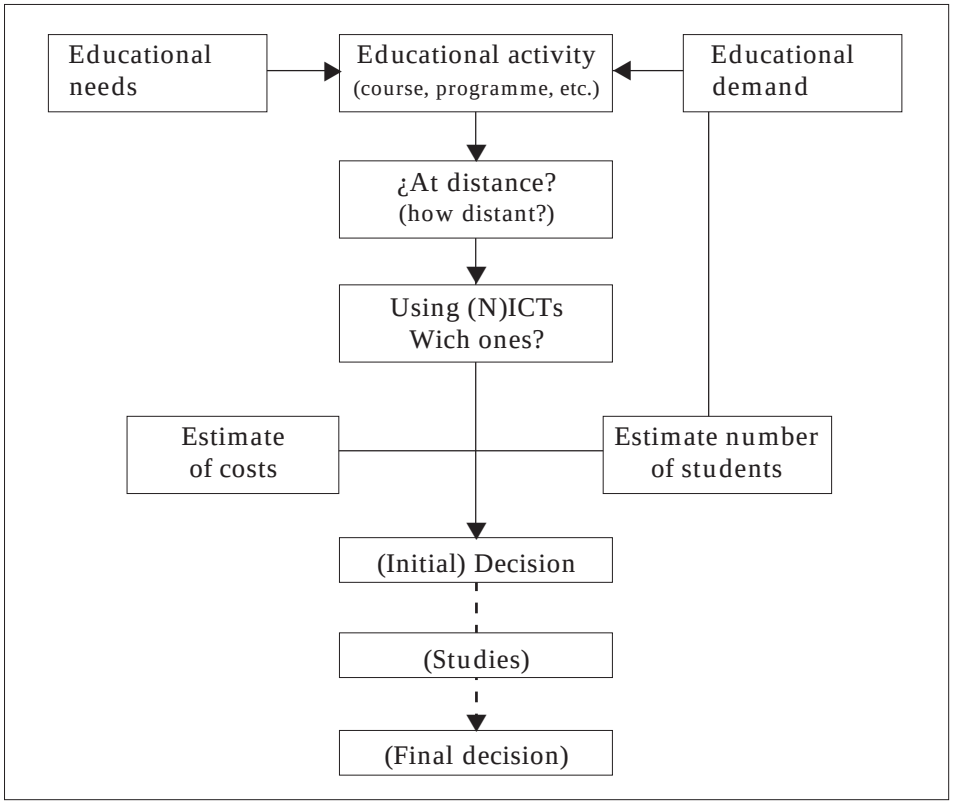
- What is demanded is something which is actually necessary and useful for vocational training.
- What is demanded is something which is not (as) necessary or useful... (for example: training in competencies that are not being requested in the labour field or in activities that are disappearing). We would be facing a "wrong" demand.
- There is no demand of what is necessary or useful (for example, training in competencies that are being required or in emergent areas that are not yet very well known).
- Behind an explicit demand there is an implicit one which is frequently not very clear (for example, there is a demand for training in marketing but in fact there is a broader demand for training in communication. Or, there is a demand for IT but with an implicit –and not clear– demand for information management).

We may engage again in another discussion about who establishes what is necessary and useful and how this is done. What we can never do, is to disregard the existing demands, no matter how "wrong" these may be. Because they exert an influence on motivation –or lack of motivation– of the potential learners in order to enrol in a course and remain in it. Therefore, it is always necessary to "read" carefully and discover the educational demands *prior to* the course and work on them *throughout* the course.

But, in this case, another question can be asked: Can these needs and educational demands be adequately responded at a distance and using NICTs? I suggest the reader going back to Chapter 2 for more reference. We must remember that there are two basic situations that may justify working through distance learning courses: the distance from educational centres and the available time of potential students; and also the scattered demand and the case of those who are not willing to attend an educational centre. Regarding the issue whether it is appropriate to use NICTs or not, some aspects such as access, costs, etc. should be evaluated.

I will further discuss these aspects in Chapter 9 and 10 but for the time being I would say that there are usually important economies of scale. In particular

when costs are high –eg: long courses–, before taking a final decision, it may be convenient to do some research to gather more exact data regarding how many students can actually be reached and what would the cost per student amount to. Although this research may also imply a cost, it can be a good investment that will save a lot of money and subsequent problems when there is not enough available information. The situation is different when there is previous experiences which allows the institution to anticipate what may happen.



Furthermore, deciding carefully whether we must or not implement a particular course and whether it must be carried out by distance or using a particular technology will help to visualise other issues to be considered. For example:

- How can we turn a potential demand into an effective demand?
- What do we do with “wrong” demands?

- What combination of face-to-face and distance courses would be more appropriate?
- What are the most adequate technologies?

A couple of examples will help us understand this issue in a better way.

IT at a small enterprise[2]

After a discussion process, a group of experts came to the conclusion that a course on "IT at a small enterprise" would be something useful, necessary and that would have demand.

According to the team, there was a "**need**": small entrepreneurs had to understand better in which way IT could help them in their work in general, and in the management of information systems, in particular. Besides, it was important for them to understand in what aspects it would *not* help them. The experts maintained that many small entrepreneurs felt lost when facing IT tools and in many cases did not distinguish well among the different options and ended up making inadequate purchases for their needs, disregarding better solutions to improve their work, etc. The course would therefore aim at helping them to make better decisions.

Nevertheless, a **demand** for a course such as this was not as clear. It was even likely that there were other closely related demands that may be confused with this one. For example, how to use a computer, their programmes, etc. The team was not willing to address this demand since there already existed other offers in the market. But they had to take into account at least two elements:

- The promotion of the course had to be attractive enough to capture that potential demand, showing somehow that there existed a need that had not been perceived.
- Besides, it had to make clear that the demand for programme management would not be addressed. Or even, channel this demand in a particular way, for example, through agreements with other entities that could cater for it. In any case, they had to keep in mind that this demand would be present.

2 For teaching purposes, I have taken the liberty to reconstruct a case in which I worked (cfr. Motz, 2001).

Would it be adequate to do a **distance** course? They believed so, because the potential learners –initially thousands of microentrepreneurs– were spread all over the country and it would be easier to reach them this way.

The only thing they needed was a computer and being able to connect to the Internet and… oops! They came across with a problem they had not considered. If they wanted to include in the course those who had not got a computer yet - and of course they wished to- they had to think of a way to do it. A cybercafe did not seem an adequate solution since many of those who had not got a computer may not be able to use one well. Therefore, the issue of **using NICTs** was not so clear. But at the same time, given the subject matter of the course, they had to be used: talking about IT without any computer at sight was not a good idea...

This led the team to think of a group work methodology. Several entrepreneurs without computer would join someone who had one, or at a place in which they could use, at least, one computer. Furthermore, this would be more motivating for those who find it difficult to work on their own. Group work would foster the learning itself and sharing experiences regarding the relationship of small entrepreneurs with IT tools, etc.

But who would organise the groups? How and where would they meet? This resulted in conversations and agreements with entities connected with microentrepreneurs: a trade union association, a financing cooperative, etc. The promotion and organisation of the groups would be channelled through them. Agreements with public and private entities were also sought in order to find available computers and space for the groups at night.

It was therefore not enough to "produce" a course: it was necessary to organise educational spaces and situations. Without them, the course would be little or "not used" at all.

Do you know any situation in which this has occurred?

Course on quality in tourist service for taxi drivers[3]

In this case, the **need** was perceived by several tourism operators: the good or bad service that taxi-drivers provide to tourists has repercussions on the whole activity. The quality of the service, the use of foreign language and the tourist information that the taxi-drivers can offer to their passengers come up as important aspects. Regarding the use of foreign language, some priorities regarding the highest tourism activity could be established. Tourist information had to be mainly local or regional, so it would be different in each place.

Again, the **demand** was not so clear for taxi-drivers who where the direct target of training, but who were not very keen on taking courses of any type. The emphasis had to be placed on the direct benefit that it may offer to them: obtaining more clients. The previous campaign had to focus on this aspect.

Would it be reasonable to do a **distance** course? It could be a way to cover scattered population with little time for training. But it was clear that it could not be done fully at distance: some face-to-face meetings were necessary to work aspects such as interpersonal communication and to keep taxi-drivers' motivation up. It could also mean a good solution to include local and regional tourist information. Therefore, regular meetings were established so that taxi-drivers from one same city could meet.

And what about **NICTs**? After doing some research, the team decided... not to use them. In turn, they opted for materials on CD (that could be listened on the taxi) and printed articles with newspaper format that would better fit taxi-drivers' culture and habits: quick reading while waiting for customers at a taxi rank.

Reading and listening to materials in the taxi and face-to-face meetings would be the two basic working methodologies. This solved better than other alternatives:

- the effective opportunity to access and use of materials,
- the work on communicational competencies,
- the work on local contents.

How have these issues been solved in the situations that you are acquainted with?

3 Cfr. SENAC, 2004a and 2004c. Again, I take some elements from the conversations I had with the DL team of SENAC-DN (Rio de Janeiro) in December, 2004. I have also taken the liberty to reconstruct the situation, for teaching purposes.

The subject matter research and diagnosis

During the decision-making process, some research was necessary to find out about two key aspects for the production of the course: the subject matter and the potential learners. Probably, after taking the decision, it will be necessary to go deeper in both issues. This is what we call subject matter research and diagnostic research.[4]

In the **subject matter research**, the contribution from the expert will obviously be essential. In general, they do not even need to conduct a research because they know a lot about the subject. However, we must ask our expert on the subject to make a greater effort and determine:

1. Which are the conceptual core aspects of the subject? Which are central aspects and which are secondary? What do you sense –or know from experience– that is more difficult and at the same time more important in the learning process about this subject?
2. How do you think the subject must be organised for learning purposes? Which would be the appropriate order to tackle the different issues? Why?

At the same time, the teacher of the team would be more concerned about the **diagnostic research** in the following way:

1. What previous knowledge do potential learners have on the subject that is going to be approached? What are their practices and experiences?
2. In which of these ideas, practices and experiences is it possible to settle the grounds to build up new learning? Which issues should be chosen to be discussed?

In order to find out these things, sometimes it is necessary to carry out a research through observations, interviews, etc. In other occasions, a poll among potential learners will be enough. Or, appealing to the knowledge of the target learners shared by the team, by making this knowledge explicit. If potential learners can be integrated, they will probably make important contributions to the discussion. Their input –will be very usefull in the *(pre-feedback stage* [5]*)* of the course.

4 I will summarize here some aspects from a previous book (Kaplún, 2004) but with important changes.
5 This concept seeks to be different from that of "feedback" in the sense that it has to do with feeding

If our expert on the subject has also been a teacher, it is likely that his knowledge becomes the basic grounds for our diagnosis, without the need for a specific research. Good teachers know, at least intuitively, many of these things and they have developed adequate strategies to help to learn. Although a distance or blended learning course is different from a face-to-face one, there is a lot to be benefited from. Thus, many institutions opt for beginning their e-learning experiences with subjects and areas in which they already have some face-to-face experience.

On the other hand, the communicator of the team will also be concerned about the diagnostic research. He will find out about:

1. Which are the specific codes of the learners?
2. What is their cultural universe like?

And the expert on technologies will question himself:

1. What technologies can be accessed by our learners?
2. How do they usually make use of them?

Again, in this case, we could resort to already available information, quick polls or, if necessary and possible, a systematic research. And it will also be interesting to include the contributions of some of the potential learners.

Therefore, it is not enough to conduct a research on the *texts* about the subject: it is necessary to do research on the *context* of the learners. And for this we do not only need to know Latin (subject matter research) but to know Peter (diagnostic research). This is the only way in which we can find an adequate strategy to teach Latin to Peter. Or even better: to help Peter to learn Latin.

With this knowledge at hand, we will be able to set the objectives and the course curriculum which are directly linked with the subject, pedagogical, communicational and technological areas, as we will see later on. We must always remember that what we are building up is not a simple material to be read, seen or listened but a set of devices, proposals of work and materials to learn; a set of objects and strategies that will promote the creation of one or a number of learning experiences.

"before" and to lead people to begin their educational processes by learning from their world, their interests and concerns. On the contrary, feedback implies confirming and adjusting the system based on that same information. (Cfr. M. Kaplún (1998)..

From the objectives to the curriculum (the articulation of the subject, pedagogical, communicational and technological areas)

Let me reintroduce the example of IT tools at a small enterprise.

According to the experts, the ***core aspect*** could be defined in the following way:

- "The possibilities that IT provides –and the ones which it does not provide– in order to improve the information systems of small enterprises".

And the ***objectives*** of the course could be:

- To help small entrepreneurs to get acquainted with the possibilities that IT can offer to them to improve their activity.
- To give them tools for decision-making in this area: purchase of equipment and full exploitation of it, etc.

The ***contents*** to be approached would be:

- information systems of small enterprises
- computerisation of information systems
- hardware
- software
- development

The suggested ***subject organisation*** coincides with this same "logical" order, except for one aspect: it seems convenient to talk first about software and then hardware because it is easier to understand what equipment will be necessary after understanding how it will be used. Moreover, in order to decide what hardware is required, the enterprise should first decide which software will be used.

Therefore, the ***course curriculum*** that the experts imagined was the following: for each of the topics, they would write down a text that the course participants will have to read. After each text, there will be some questions or exercises that would help to reaffirm what has been learnt and/or put it into practice in some hypothetical situation.

But the teacher had something to contribute with. He started by asking: what experiences or ideas do small entrepreneurs usually have on these topics? And the team began to investigate, by conducting some quick polls. These showed

two basic ways of relating to the topic, two different assumptions, two *constructive ideas* onto which a new knowledge had to be built:

- On the one hand, some believed that IT tools were capable of solving any kind of problem.
- On the other hand, others did not trust IT; they considered it an unnecessary expense that on its own cannot solve any trouble.

The first assumption is open to the incorporation of IT tools but without too much critical thinking about it; the second one criticizes IT tools so harshly that they are totally opposed to them. A "critical openness" was probably the best path to be suggested.

Some others put forward a mixture between these two tendencies. "*I bought a computer and in the end it wasn't useful at all. Now my son uses it to play games...*" In the first place, this person believed that IT tools "would change everything" but then he was disappointed. For example, he perceived too late that as he would not know how to use them, he would have to hire someone thus increasing his costs. But, eventually, what he would obtain were spreadsheets containing the same information that he had been writing down in a notebook without great difficulty… Becoming aware of this and other failure cases with IT tools is a central element in order to think of the course.

The ***pedagogical core*** can therefore be defined in the following way:

- From IT tools as unnecessary expenses to their appreciation as a tool that improves processes and reduces the efforts of managing the information at a small enterprise.
- From IT tools as a magic wand that solves everything, to its rational application in places and cases where it is worthy.

Both aspects of the core imply questioning constructive ideas, to generate a *conceptual conflict*. That is, *deconstructing* constructive ideas (cfr. Pillar Grossi, 1994). But this is not the same as destroying: if learners feel attacked –if, for example, one is treated as a fool for his previous ideas– he may reject any kind of training proposal.

As you can see, the pedagogical core is a route, an invitation to move from one place to another.

The ***pedagogical objectives*** could be:

- To help rethinking ideas and practices of the participants regarding the use of IT tools at a small enterprise.

- To facilitate a better understanding of their potentials and limitations of these uses.
- To provide tools for better decision-making about the incorporation and use of IT tools at small enterprises.

In order to make these objectives and path possible a ***pedagogical schedule*** must be suggested. For example:

- Expressing constructive ideas to entrepreneurs. For this, we may resort to examples that express them, as in the already mentioned case of failure, which includes the two main detected tendencies. But we may also suggest activities that, from the beginning, may eradicate the experiences and previous ideas of the participants. These can be debated in group work, or shared in a forum, etc.
- Contrasting constructive ideas, by analysing the causes of failures and possible solutions.
- Gradual and easy introduction to concepts used by experts on this area which may be useful to make decisions regarding the incorporation of IT tools at small enterprises: information systems, software, hardware, development.
- Activities that permit the application of these concepts in the initial examples and, above all, in other cases; including those contributed by the entrepreneurs in order to facilitate their assimilation.

In order to imagine concrete ways of carrying out these activities it is necessary to have a look at the ***working methods***. Now, the groups seem an advisable option; not only due to technological reasons but also pedagogical ones. But other resources that facilitate the individual construction of knowledge must be provided. For example: a kind of game "of patience" in which learners have to make pairs among tasks or activities of an enterprise and appropriate programmes for them. The combination between individual or group work usually promotes learning processes.

This leads us to a ***course curriculum*** that gathers the topics suggested by the expert on the subject but in a very different way. There will not only be conceptual texts but many examples, invitations to reflect on personal experience to share and discuss them with others.

But we must still listen to two other members of our team. This is what the communicator believes: He has been concerned about becoming familiar with

the world of small entrepreneurs, their problems and experiences, their way of talking and relating with each other. And then he uses his creativity and starts to imagine possibilities such as these:

- Stories of some small entrepreneurs who have lived different situations with IT tools. These may gather at a place in common in which they tell their own experiences. For example, they meet at a bar at lunchtime…
- Take one story in particular. For example, that one already mentioned of IT failure. Since it is the story of a pasta manufacturer, some of the elements of his world could be used to imagine his world and set up a game of images with IT elements: ravioli that look like chips, vermicelli that look like cables…

In the first case, the ***communicational core*** would be the conversations at the bar. In the second case, "microchip *vermicelli*"... puns, metaphors and accounts regarding this aspect may be useful to build up a ***narrative development*** of the course materials. This will help a lot to have participants "hooked" with the material, which may be difficult with a cold and unexciting text.

This will also add new elements to the ***course curriculum***. For example: every unit would start with a conversation at a bar and would invite participants to "join" this conversation by discussing the opinions of the people involved and contributing with their own experiences.

What other communicational cores could be imagined in this course?

Our technological expert has also been worried. Considering the ***available technology and the use*** that entrepreneurs make of it, he supports the idea of establishing two working methodologies: one individually and the other in groups, with different versions for each case.

He has his own favourite platform that he knows well and recommends for this job. Among other advantages, it is free software and it does not require any previous installation. But... to work with it, one should be connected to the Internet. This would not be a problem for those who meet at a public place with broad band access but it may be more difficult for those small entrepreneurs who only have dial-up services. It may be advisable to assess the possibility of sending in CDs all "heavy" materials (images, sound, videos) that may take a long time to be downloaded, and using the platform mainly for interactions (mails,

forums, etc.). Or it may be advisable to leave this platform aside and use another one which may be used without being online[6]… but this one requires installation and the organisation of the course will consequently become too difficult. A particular ***technological core*** is determined: an Internet-based platform and delivery of materials in CDs.

For group work –and in fact for individual students as well– he insists on materials with texts and charts designed in such a way that they could be seen in a screen and also when printed, thus using appropriate formats and avoiding colours that may not be seen well in one-ink printers. Another alternative is to provide already printed material and to use the computer only for interactions. But this of course changes production costs and they finally decide not to do so. In any case, we must remember that reading long texts on a screen may be uncomfortable for many people.

Apart from printable or screen ***formats***, with sound or video, we must plan a series of ***devices*** that can be easily adaptable to pedagogical and administrative requirements. For example:

Interactions. They are face-to-face in the case of groups. In order to interact with the rest of the participants, these groups would be one user with an e-mail that identifies them as a group. Since he anticipates that many of the students will not use the forum, he opts for sending out everybody's interactions to a mailing list.

Tutorials. They will reply through e-mail and in the list. But he also suggests tutors being available over the phone during certain hours a day: the IT culture of microentrepreneurs will not feel satisfied with one way of contact only.

Enrolments and attendance. Databases will have to be arranged for this task. Luckily, in this case the certificate will only refer to attendance and there will be no knowledge assessment.

This will of course affect the ***course curriculum*** which is where all our experts meet… Another issue arose that changed some of the technological decisions.

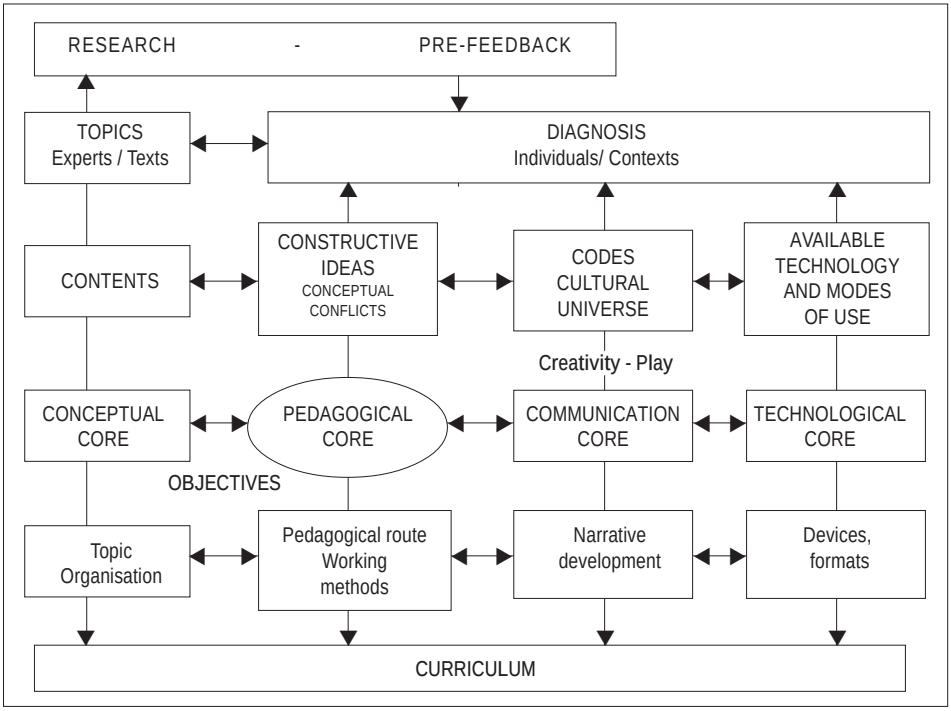
The idea of delivering a CD implied that all the material had to be ready before starting the course because sending several discs was not really practical. This is not always possible and in some cases it is not even desirable. If we work with a course which has been fully designed beforehand, it will provide little

6 Such an option was developed by a Uruguayan team (cfr. López, 2004)..

opportunity for change in order to adapt to specific needs of the learners. If the learning processes are knowledge construction processes, a course that helps to learn may be more efficient if it is built up according to concrete knowledge and the interaction with participants. It may therefore be convenient to revise the idea of CDs, to leave out videos and to concentrate on "lighter" materials that enable to work only through the Internet which is better adapted to the idea of slowly building up the materials of the course…

Do you agree with the technological decisions made?
Which alternative decisions could work better? Why?

As can be seen, all decisions are interdependent. This is why it is so important to work *together from the start* - among the four areas of expertise. The idea is not to work in a successive production chain where subject issues are defined first and then come the pedagogical, communicational and technological aspects. This joint effort is what I intend to show in the following chart.



The core in this chart is of a pedagogical nature, because it is there where the individuals and the topics converge and where the course's objectives are knotted.

A question that may arise here is how the *objectives for the course's target audience* should be expressed: from the pedagogical perspective (as it was presented above) or from the point of view of the subject matter? Maybe both aspects should be blended…

How would you set the course's objectives for microentrepreneurs?

Finally: the curriculum

There are several ways to design the curriculum. Some prefer to have more complex designs, others, simpler ones. The usual thing would be to design tables such as the following:

Unit 3: Software **Pedagogical core:** **"From the software to the tasks" to "from the tasks to the software"**					
Objectives	Contents	Activities	Time	Materials	Equipment
Understanding the relationship between the company's activities and IT applications	Applications Packages Operating system	Game Reading Discussion	2 hours	Game Text	DL equipment

This scheme may take a variety of forms. Two or more columns may be gathered or a column may be divided into more than one.

The initial curriculum will not have an exhaustive development yet. Its purpose is to make a general overview about the course and give an approximate idea of the total duration of the course, the materials that will be used, the human resources needed to implement it and the budget. Then, at the production stage, this scheme will be disaggregated to the necessary detail.

The starting point of this process is usually the content. Giving each of them an order and a time seems to be the central task in curriculum design. As it may be clear, content is not the main aspect at stake, though it is not a minor issue.

A key indicator that the course has been properly devised is what is included in the column ***activities***. If these activities mainly imply "reading" then something must be wrong. A course is primarily a group of educational activities. Reading - which often implies listening to lectures given by teachers in classroom courses – should not be the only activity. Verbs such as discuss, reflect and write, do research, analyse, should be much more present. Even play, as it is shown in this example…

This is why DL texts tend to be more intensive than extensive. It is reckoned that three or four pages represent one hour of educational activity (Auñón, 2000). If the aim was just to read them, then it would only take fifteen minutes… This does not mean excluding individual reading material, like the one used on a regular course. However, this material should not be the whole course; it should rather be its bibliography. They can usually be selected or prepared by subject experts without the need of support by the rest of the team members. Nevertheless, a work guide usually requires some collective effort from several or all of our "musketeers".

In the ***materials*** column, it is important to establish whether students will be the only ones to receive them or if tutors also will receive specific materials. Sometimes, even the latter are the main ones to be prepared, depending on the working method previewed; for example, when the intention is to design a general strategy that aims at a strong generation of knowledge on behalf of students. Or, rather, when several specific contents are developed at a local level but respecting the particular features of each place.

During this first planning session, the column ***equipment*** will show us if there is an adequate number of team members or if it will be necessary to add new ones. For example: if a video will be included, it will be necessary to hire specialised staff for the task if there is no one available at the institution.

Chapter 6
Design in detail: pulling rabbits out of your hat

The previous chapter showed the great decisions that have to be made when designing. Maybe, at certain points during your reading, you have experienced that you were pulling "rabbits" out of your hat. At the same time, some others seemed to be disappearing without further explanation. A game appeared here, an assessment of knowledge disappeared there…

If you are an experienced teacher, you probably have many other rabbits under your hat which you can take out whenever it suits you. It is impossible to name them all. I am only going to describe those which seem interesting and relevant to this book. They are details of the design and they can be decisive at times.

From groups to learning communities

What is a group according to you?
Can forty students in a classroom be considered a group?
And what about four people waiting to see a doctor in a waiting room?

As I have been saying from the beginning, distance learning does not mean isolated learning, as it was once regarded (and though many continue to think of it in that sense). DL has increasingly become "no distance" learning (Giusta, 2003), which allows us to interact just like or even more than learning in a classroom setting. An interaction that is vital to every learning process.

In this sense, working with small groups is usually essential since it allows for more intense interaction among members. But there are many kinds of groups and many functions small groups can develop in education.

A group may carry out an activity just once and then disappear as such, then other groups may be formed to perform other type of activity: discuss over a certain concept, define a problem, come up with a proposal, take part in a game, etc.

More permanent groups may also be formed. For example, to make a diagnosis or conduct some research, to devise a project and carry it out, to write a collective paper, etc. The single fact that these activities exist (research, projects, etc.) usually means that the educational space builds a closer relationship with the real world; thus, theory and practice do not appear as separate compartments of stagnant knowledge.[1]

However, working in groups is not easy, particularly when we refer to permanent groups. An operating group (Pichon Rivière, 1985) or working team, which is the case here, is a group of people that may agree or disagree, that may have different interests and abilities which cannot always be put into action collectively. Groups are basic cells of educational work, but these cells may easily die. Therefore, today more than ever, educators should learn a lot about groups and their modes of operation.

At the same time, it is important that the general objective of the group work is not lost: learning, collective creation of knowledge, development of a project, etc. Often, groups concentrate on their operation problems and they lose sight of their objectives…thus, they end up working even worse because it is frustrating to make no progress regarding their reason for being.

But, how can groups be formed at a distance?

Some options:

- Forming groups of people who physically live near each other, whether in the same city or region. It is easy for them to get together in this case. And sometimes it is not even necessary to get together. This is the case of groups that have a history together and the course was designed on the basis of these already existing groups. For example: the employees of a company.
- Forming groups at face-to face meetings which then continue their work at distance. It may be the case that members look for ways to gather

1 Cfr. Núñez, 1985; Pozo, 1999; Barato, 2004; Catalano, 2004.

together physically sometimes, by sharing time together and contributing to their own consolidation as a group.

- Forming groups only at a distance. Sometimes it is the only option, but it is probably the most difficult one. It is possible that interesting interaction takes place within the large "group", for example, during a forum; however, it is not so easy to create a strong commitment to team work of a small group in this kind of manner. The e-mail and chat seem to be good resources to keep the group together, though not so much to form it.

There are two functions that tend to be necessary inside a learning group: **coordination** and **register**. The first one may include aspects such as preparing an activity in advance, assuring attendance and general participation, taking notes and giving the opportunity to intervene, etc. The second one implies summarising group discussions and conclusions, which is particularly relevant to DL when it comes to sharing results with the teachers' staff and the rest of the course.[2]

These functions may be accomplished in different manners: rotating or fixed, explicit or spontaneous, individual or collective. But they will be necessary and they may require the support of teachers, materials and specific remarks regarding particular tasks to be developed. It is not always enough to say: "get together in a group, work and share what you have done with the others".

Depending on the group's nature ("natural" group or group formed for the course's purposes, ages and experiences) and the kind of task assigned (concrete or permanent, more or less complex, requiring more or less commitment), it may be very useful to prepare **tutorial support** in advance **for each group**. An interesting resource to make it possible is to resort to good former students. Not only can it reduce costs –it can even be voluntary work– but also their recent learning experience can provide them with better resources to help others, by having an intuition about the "zones of proximal development" of beginners (Vygotski, 1978).

A problem small groups have is that they may be too concentrated on their task in such a way that they overlook **what other groups are producing**. To make the most out of their contributions, creative ways of introducing groups may be of aid (beginning by a name that is easy for others to remember) and having the teacher staff summarising the main contributions made by each of them.

2 For a deeper development of this kind of tasks, see Kaplún, 2004b.

When time and distance prevent small groups from being formed, it is still possible to promote profitable exchanges and discussions inside the larger group, whether at forums or mailing lists. In order to achieve this, it is necessary to propose **genuinely interesting discussions**. "Didactic" questions or, worse, rhetorical ones (where the answer is contained within the question) hardly ever arouse any genuine interest to participate. Interest can be generated, conversely, by difficult or controversial cases, i.e. presenting two or more opposite and well-founded positions regarding a certain issue, having different diagnoses for a single situation or several solutions to one problem. Some tutors introduce some mistakes on purpose, as a means of starting up a debate...

Participants themselves may also suggest the cases, questions or doubts that concern them the most because they have come across them at work and have been unable to solve them. To doubt and to pose oneself questions is crucial for learning. Sharing with others helps to create **learning communities** (cfr. Viser, 2000; Pazos, 2001; Pereles, 2002; Kaplún, 2005).

Particularly when it comes to groups of adults who have a long working experience, it is easy to regard the educational space as a learning community, where everyone can share knowledge and experiences, problems and doubts that stem from their everyday activities. When there is no such experience, it is also possible to create life-resembling situations that may serve the same purpose; that is, work projects, case discussion, etc.

Games

The word "game" has several possible meanings. It resorts to the ability to imagine. Making up situations, imagining and proposing possible worlds. It also looks for commitment and tension between competition and cooperation. There are puns and board games, body and mind games, individual and team games, the idea is to play and to dare to play.[3]

All these senses can be very powerful in terms of educational work. To put into practice educators' ability to play and open up spaces to enable learners to play is particularly important in DL. We will now consider some examples.

3 For an extensive approach on the subject see Winnicott (1971).

Puns and imagery games

- Microchip ravioli in the IT course for small enterprises (Chapter 5). The title "three musketeers" in Chapter 4.
- In a multimedia course about how to prepare coffee, the "presenter" of each topic and the main character used to be a coffee grain (INA, 2005).
- A distance course which is described as a shared journey. We follow a path, sometimes everybody gets on board on a boat, other times we go by train, etc. (Grupo Aportes, 1997).

Board games

- … Although the *board* can be the computer's "desktop", like the game of patience about software at the course for microentrepreneurs (Motz, 2001). It also included a board version to be used with a group, with cut-out cards.
- Path games on a board, where one moves forward or backwards as hurdles are overcome, questions are answered, etc. For example, when dealing with health at work, they may include accidents that can be avoided, preventive measures that may be taken, etc.[4]

Games with the body

- Role-plays, where participants, without prior agreement, play a situation that is later on analysed. A taxi driver and a passenger,[5] a shop assistant and a customer,[6] etc.
- Drama, agreeing upon the script they will be acting out. This may serve as a means to pose a problem, summarise a discussion, etc. Participants may play a role or they can be part of the material that has already been designed for the course. The intention is to start up a discussion from that point (the taxi driver, the shop assistant) or combine both methods.

4 For example, we could mention the educational game series developed by the Education Research and Development Centre (CIDE) in Chile during the eighties and nineties, which can be taken as a model to think about new possibilities.

5 Just as it is suggested by the Tutorial plan of the already mentioned course run by SENAC (2004a). In this case the intention is to work with difficult situations participants have lived and which are previously told in an anonymous way. Among the delivered audio materials, on the other hand, there are a series of dramatised situations of this kind.

6 As it could be done in a Customer Service course run by INA (2000). In this case the material includes videos with dramatised situations.

The fact that students are the actors –not only the audience– will depend on the availability of face-to-face sessions with the whole group or small groups. To perform implies much more than watching others and it often brings more intense learning. One *dares* to do more, and puts more of oneself *out there.* However, it is necessary to be careful: as one is exposed in front of others, there can be more fear of criticism or of feeling ridiculous. That is why playing requires an appropriate atmosphere; it is necessary to make clear we play to learn and not to criticise others.[7]

Simulation games

- A company can be simulated; an advertising campaign for an imaginary product can also be simulated, etc. The idea is that this allows to live a situation that is similar to real-life practice; problems can be perceived and the concepts involved can be understood. Different groups can come up with different proposals and defend their advantages before other groups.
- Along the same lines, different situations can be simulated in *debate games*: a negotiation (commercial, salary, etc.), a trial with a defendant and a prosecutor (an enterprise, a job modality, etc.).[8]
- There also exist IT simulations about different chemical, physical and mechanical processes. Springs with different resistors are observed, hydraulic pumps with simulated failures are checked (SENAI, 1998), etc. There are several Web pages where one can have free access to this type of software[9] and vocational training institutions that have developed their own.

Imagination games

- In Colombia, a long distance course with NICTs has a space for "lunadas".[10] Just as around a campfire, participants "tell stories" and let

7 That is why I think it can be dangerous to use it for assessment purposes. The nervousness of the moment can go against the game… Conversely, we could think of virtual role-plays, such as the ones that have become popular in the last few years. There the fear to exposure can be avoided by using a nickname.

8 These and many other possibilities can be found in different guidebooks on participation techniques in educational work; among them we find the classic by Bustillo and Vargas (1988, with several re-editions in a variety of countries).

9 For example, Modellus, which also allows to create them (http: / / phoenix.fct.unl.pt / modellus).

10 As we could experience in our visit to SENA in Bogotá in February 2005.

their imagination run free. Since it is a course on international trade, they can imagine they are in a fair where different countries present their products. They imagine how to arrive, the organisation, what they will find there... They get so enthusiastic that they want to go to a real fair. From time to time they have a "lunada", with another topic that will trigger their imagination. At these spaces, more students –or more eager students – tend to participate. More "serious" forums are not so popular. And learning takes place anyway… or even more, since that enthusiasm they have while imagining a possible world in which they could live resembles make-believe play in children.

Finally, the possibilities offered by play are countless whenever we bolster our creativity and try to solve specific educational problems. Some of these games can become the *communicational* core of an entire course.

- The "glasses" they had to wear in order to see things from a gender perspective also helped to articulate other metaphors later on: looking through a pair of binoculars, windows to new views, pictures that "capture" the present reality of an institution... (Cinterfor / ILO, 2004).
- A city with its diverse systems (health, traffic, security, etc.) worked as a metaphor for several IT systems and their ability to operate in an articulated manner. At the beginning of the course, participants were granted citizenship; they even received their identity card.[11]

Cases and projects

Working with projects and cases are strategies that allow to acquire knowledge from the starting point of practice. There are different ways to do so, some are similar to play and other are more "real"; they have different degrees of complexity in terms of preparation and follow-up of the work. (Cfr. Barnes, 1994; López Caballero, 1997). We are going to consider some alternatives now.

- Groups are formed and they begin to discuss a *real case they are familiar with*: a company, an organisation, etc.; or even a conflict, a crisis they underwent,

11 This activity was developed by a group of students of the Workshop Seminar on Community and Educational Communication for the course on Interoperability of the School of Engineering of the Universidad de la República in the year 2002.

an accident, etc. All groups may study the same case and then compare answers. Or else, each group may choose a different case so that the exchange is richer and everybody can learn more. It can be a brief and straight-to-the-point discussion or it can guide a whole module or course. While studying the case, learners work with concepts they have seen during the course and / or the intention is that they spring from the work itself. No previous preparation on behalf of the teaching staff is required here; there is not much commitment to reality in fact: even though it is a real case, the idea is not to intervene in a real way but rather use it as a motivation to learn.

- Another strategy is to offer *already prepared real or imaginary cases*, with all the necessary information or only part of it. One or more questions are proposed to trigger group discussion: "what do you think may happen in this case?", who do you think is right in this situation?" Another possibility is to discuss what information might be missing which would be necessary to have a better understanding of the case or to find a solution to the problems posed. This strategy requires more preparation on behalf of the teacher who is in charge of selecting the case and gathering the information he or she deems necessary to discuss the case properly. The chosen case has the advantage of orienting the discussion towards topics that may be of interest in terms of learning but which could not appear in the cases chosen by participants, where even important information might be missing.
- A **project** usually requires relatively long work time, particularly if the idea is not only to present it but also to carry it out. In this sense it can be the centre of a whole course. It may be individual, or even better, in groups. A limited way to deal with projects is by having the *training institution itself requesting something* that the group must cater for. For example, building a device that may solve a practical problem, some pedagogical need, etc.[12] This has the advantage that the suggested problem may be specifically oriented towards the intended learning and that the mistakes made may be assumed without the risk of affecting other people inside the institution.
- Projects can be proposed by *students themselves or the institutions where they are working or doing an internship*. There is nothing here that can be prepared

12 This kind of strategy has been developed with some good results in some SENA centres in Colombia, according to what we were told by the people in charge of it in February 2005. For example: during the year, students in a cooling course built a device that was to be used for teaching in their own work area.

in advance, except, if possible, the conditions to allow students to work efficiently in that place. The ideal thing would be to have a previous demand on behalf of the institution, since this will show their interest in the intern's intervention. If it is his or her place of work there is no problem with the presence of outsiders. However, it is not always easy to break with long-standing routines in order to do something different and allow the student-worker to take up a different role. The prior pedagogical agreement should encourage a learning atmosphere, where mistakes are admitted as part of the process and where important margins of freedom are given to welcome new solutions.

- An interesting alternative would be to combine vocational training with *project or enterprise incubator* systems. For example: the course finishes with the presentation of the project, which, after complying with certain requirements, may be apt to enter incubation to be then carried out with appropriate materials and technical support.[13]

The typical stages of a project should be: defining problems or needs, diagnosing, setting objectives, planning, executing, assessing. It is particularly necessary to insist on two important aspects for learning throughout this process.

- Defining a problem or need properly and making a good diagnose is essential. Subsequent errors often have their origin here. It is important to encourage students to think carefully about this point and not to advance quickly after the first definition that comes up or that is proposed. This may imply discussing the definition of the problem with the requesting organisation – a discussion that may not always be an easy one.
- There is almost never only one solution for a problem or need. It is important to stimulate students to imagine and assess several alternatives, to look for new solutions to old problems and to propose new problems that have never been thought of. That is: stimulating the ability to innovate.

13 A strategy followed by SENA (2005) at its Cátedra virtual de pensamiento empresarial (Virtual course of business thinking).

Assessment

We could say: "Tell me what and how you assess and I will tell you what your pedagogical approach is". Indeed, the way of assessing affects all other pedagogical options. For example: many things can be said about participation, collective learning and collective construction of knowledge; but, if assessment is limited to an individual examination that measures learned-by-heart contents, then the whole educational activity becomes inconsistent. One of the first things people find out when enrolling for a course is the assessment criteria. And this strongly affects their attitude during the course. If they know that they will be positively assessed for repeating everything teachers and books say, it is likely that they refrain from expressing opposing points of view.

There certainly are different situations that require different assessment. For example: courses that require formal accreditation, that authorise vocational exercises or other training levels and other courses that do not require that.

In any case, assessment is always surrounded by tension: assessing products or processes? Results or impacts? Traditional pedagogical trends say that it is essential to assess products and results, and little or no attention is given to processes and impacts.

Assessing results and products tends to be easier. What matters is what has been learned and the traditional way to assess that learning is through a test where students prove how much they are able to produce. However, they are not so much concerned about the process followed: how they learned, the starting points and difficulties to overcome, the ability to think of alternatives to develop along the way, etc. And the impact is neither assessed: if after the test they are still able to use new competencies, if after a while they can still put into practice what they learned, if their working style changes in some way or if they go back to their old working style.

Without overlooking results and products –which eventually are the expression of a process– we will now consider some alternative strategies to traditional tests that may allow to assess processes and impacts at least up to a certain degree.

Process assessment:

- *Projects*. Project design should be assessed from the point of view of products and results but it also offers several possibilities for process assessment.

For example, partial results that may show the progress during each stage: defining the problem, diagnosing, etc. This case will clearly show the differences between what has been done and what was planned; the ability to adapt or not to the plans.

- *Portfolio*. It can be linked to projects or any other working method. The idea is to save all the products that appear during the process and integrate them to the assessment. There can be individual, collective or combined portfolios. It is possible to have electronic folders where documents can be kept as a record of the work done.
- *Logbook*. It can also be individual or collective. It basically consists of a register of the activities developed; it is particularly useful when working with projects.
- *Parallel text*. (cfr. Prieto, 1999). The idea is that the students write down the questions and reflections that come up throughout the course, with regards to what they do, hear or read. In a way we all tend to do this, but we do not necessarily write it down in a clear and systematic way. It can also be part of the diary or logbook.

The latter focuses on a crucial function of assessment which is not always well appreciated: facilitating summary writing, being aware of what has been learned and the paths followed to reach that learning. That metacognitive function should always be present in some way in assessment processes.

Impact assessment:

"Something I am planning to do is…" Specific findings about the future use of what has been learned could be included by the end of a course. For example, students can be asked to complete the following sentence: "*after this course I will…"*

Commitment to change. (cfr. Lockyer, 2001). It is similar to the previous one, but it is more precise and implies a follow-up. Students write down on a sheet of paper what they are planning to do in their work to apply what they have learned during the course. The commitment assumed is then re-sent to them some time later (it varies from three months to a year, depending on the subject) and they are asked whether they have been able to comply with their commitment or not and why. Some systems only apply this type of assessment, leaving aside any kind of knowledge assessment.

Projects. Again, they can be a useful tool. For example, the employees of a company may finish a course by presenting a project and leaving its execution for later on. Verifying whether the project has been carried out or not, to what extent and in which way can be good indicators of impact. However, implementing the project does not necessarily guarantee future impacts, though they can give some clues. The same happens with the opposite situation: if nothing could be done, then it is likely that future impacts will be low. When it comes to collective commitments, then the impact may be stronger: it can be harder for a single person to change already established routines and work practices.

Another important issue is **who assesses**. Usually, only the teacher assesses students. Nevertheless, it seems desirable that students get to assess the teacher too, together with a self-assessment and a general course assessment. There are several ways to do so. For example:

- *Individual questionnaires*, probably anonymous. A simple one I often use includes open sentences to fill in such as the following:
    1. Something I heard or saw during this course which I will never forget was…
    2. Something that made me question myself, that made me think was…
    3. Something I would have liked to see in depth was…
    4. Something I am planning to do from now on is…
    5. Group work was…
    6. What I liked least about the course was...
    7. What I liked the most was…

An extra one could be added in order for students to include something that was not covered by the other questions ("what was left for me to say was..."). According to the circumstances, questions may be taken out or added. For instance, including questions that are specific about teachers, the methodology, materials, etc. Some may be Yes or No questions and some may have levels (scores or categories such as: very much, enough, little, nothing).

- *Self or group assessment*. It is possible to share with the group the criteria teachers will use to assess and ask students to self-assess themselves according to such criteria. It will be interesting to discuss with each of them the possible differences. A discussion can also take place about assessment criteria themselves. This can be very enriching.
- *Assessment during the process*. It is advisable to check how the course develops throughout the process, by giving room for everyone's participation.

This can help detect problems in advance, before it is too late to correct them. It is true that "packed" DL courses, where all the material is prepared in advance, may leave little room for change. But, as I will say in the next chapter, it is not the only option. And even there, tutors have still some margins between which they can move.

We will now look at three issues that have been the centre of the debate on assessment in general and e-learning in particular.

- *Multiple choice questionnaires* about knowledge, either used for assessment or for student self-assessment. They are very practical since they offer automation possibilities and they can be built in a very sophisticated manner so as to ensure their quality. However, they have also been questioned because of their limitations at the time of offering qualitative data and information about processes or to stimulate critical thinking, since they usually only admit one single answer. The name "objective tests" indicates that any observer will assess students in the same manner –in fact it is not necessary to have a human assessor. However, it forgets that making questions is always subjective. And little margin is left for new questions to arise. Therefore, they should not be the only assessment tool if the aim is to assess knowledge-acquisition processes.
- *Criteria for competency performance.* In competency-based training modules, performance criteria allowed to make a more efficient assessment since accurate evidence was looked for and used as objective indicators of having acquired some specific competency. Indeed, this allows to clear up many discussions that are rather confusing. During the last years, significant progress has been made in competency-based curriculum design, with their corresponding performance criteria and evidence gathering systems (cfr. Catalano, 2004; Vargas, 2004).

  However, I still consider that there are several problems that are not easy to solved by this approach. In the first place, complexity: the number of competencies and performance criteria is usually too big and it is not easy to verify them all. Secondly, indicators or evidence imply an agreement on what is understood by knowledge, performance and attitudes, though these concepts are far from being agreed upon (cfr. Barato, 2004). There is probably more agreement about "performance", however, it is the most difficult criterion to assess at a distance. In the third place, the definition of compe-

tencies themselves. When this is done in a collective and participating manner, it can be a powerful tool for assessment indeed. It should include the revision of the initial definition of competencies. When experts are the only ones involved in the process, I think it is necessary to look for additional criteria that may include students' own perceptions about themselves and their specific context of action; and not only assess them homogeneously and from the perspective of a specific external competency.[14]

- In the field of vocational training, many of the aspects that refer to performance can only be assessed through *attendance*. For example: how can a cooking performance be assessed at a distance?[15] Many DL systems plan a final assessment in a classroom setting, at least if they grant some sort of accreditation. The intention here is to avoid possible frauds; but in vocational training we can add the physical impossibility to assess many areas without a visible manual activity and a tangible result (or a flavoursome one, if we talk about cooking…).

Good answers... and better questions

Questions are a very useful teaching resource, they are a learning tool. The quality of our questions –the ones we pose or the ones we elicit from our students– can be good indicators of the quality of our courses.

Maybe, the most important questions are those posed by students. I will come back to them in Chapter 8. From the educational point of view, as a teaching aid, questions posed by the teacher or by the DL material are also helpful.

But a question can serve several purposes. To see it in a clear way I will suggest the following activity; imagine you were doing a distance learning course.

14 A discussion on these subjects may be found, for example, in Mertens, 1996; Zarifian, 2001; Díaz, 2005.

15 This was precisely one of the doubts we discussed with SENA's team in February 2005 regarding a course on "cocina criolla" (créole cuisine) that had been run recently.

Take a look at the following questions that were taken from previous pages:

1. Do you know any e-learning programme with this pedagogical approach? (Chapter 3)
2. In which pedagogical approach would closed materials be more appropriate? And half-closed materials? (Chapter 3)
3. Outsourcing: what and how much? (Chapter 4)
4. What other communicational cores could be imagined in this course? (Chapter 5)
5. Do you agree with the technological decisions made? Which alternative decisions could work better? Why? (Chapter 5)
6. How would you set the course's objectives for microentrepreneurs? (Chapter 5)
7. What is a group according to you? (Chapter 6)
8. How can groups be formed at a distance? (Chapter 6)

And now we could add:

9. What different functions do you think these questions have? What other functions could a question have?

We could stop here. We could wait for your answer and the answer of other readers. We could put such answers in order, group them, comment on them, add new ones, question some of them… I think it would be an enriching exercise. We would learn so much together. There are probably things I have never thought about and things I should start thinking of after listening to you. In fact, I have learned a lot from and with my students in this way. They have made me rethink about much of the stuff I took into class with me...

Since I cannot do that here, because I am not in a course –neither a distance course nor a classroom course–, I suggest the following functions of questions which I have thought of.

A question from the teacher to the students or a question included as part of DL material can be useful to:

a) Examine students' prior knowledge[16] in order to build from that point on by adding new information or questions that may facilitate the acquisition of new knowledge.
b) Encourage students to be aware of their prior knowledge and be able to use it as the starting point of new learning, by adding to it or questioning it.
c) Relate new knowledge to previous knowledge; make summaries and comparisons.
d) Relate new knowledge to previous experience or practices, confront what has been taught in class with other environments (work, everyday life, etc.).
e) Put a tool (conceptual, procedural, etc.) into practice, exercise with it.
f) Foster debate, encourage the consideration of opposing, alternative or supplementary points of view.
g) Point out a difficult or controversial issue and suggest a way to solve it. (It is almost a rhetorical function, since the question may trigger a primary reflection before reading the rest. It may work well as a heading or subheading).
h) Assess, evidence acquired knowledge, lived processes, abilities to perform, personal or collective transformations, mastered competencies.

Except for case (g), they are activity-questions and they might take good working time before moving on to something else. But case (g) can also be turned into a full activity if after the question is posed, a discussion is proposed and then a text and a presentation are introduced. In this case, the function could be the same as case (a) or (b). Or both, since these two functions usually go together.

… And we could now include a new question:

10. What functions (a…h) do you think questions 1 to 10 accomplish? (that is, including this one).

16 In all cases the word "knowledge" can be substituted with other words: skills, performance, attitudes, etc. However, knowledge can be enough if it is taken in a broad and integrating sense, where "knowing" is also the know-how to do (or doing-knowing), some knowledge that stems from practice, the knowledge about "building" a construction worker has but that cannot possibly express in words, but "knows" how to do (cfr. Barato, 2004). If you prefer the word "competencies" to express this, I have no objection.

In e-learning we could create a game in which you could drag the mouse to a function (a...h) together with a question and check whether the answer is "correct". We could add a little bit of "cheating": accepting more than one correct answer in several cases and pointing that out in some way. Or not having mentioned some function that corresponds to question…Could this have happened maybe? (This could be our question number 11…).

It will be very interesting if you take some time and think about it. *We know, however, this is not usually the case.* You will tend to go on reading (or you are already fed up with so many questions and you simply will not read or think about the issue anymore). The resource of old self-learning books that is programmed to work with a card to cover the answer did not work very well either. Having a key with the answers at the back of the book did not help either. This happens a lot in e-learning, except that the answer does not appear before the student writes or selects an option. And this is not even certain, unless the software blocks the student's advance until he or she answers. And even in this way, if it is only a self-assessment and he or she finds out that it is enough to answer anything without thinking so that the software would let him or her move on...

And so? Are these questions worthy?

What do you think? (Question number 12…)

Do you want to know my opinion?

(What shall I do? Shall I give my opinion or shall I wait until a debate arouses at the forum? But there is no forum here...).

My opinion is that they are worthy. But in this particular case, rather than engaging in a complicated game, I think it is worth going back to the very beginning and start by simply asking: how are teachers' questions to students useful during educational processes?

And it is likely that most answers would say: "to assess".

Unfortunately, questions in education have been overloaded with this function, sometimes leaving aside other important functions they may have. Even worse, assessing often acquires a prosecuting or punitive sense. "I am assessing you".

If we arrived at this conclusion together, it would then be interesting to show the examples of questions 1 to 8 and once we have that, move on to question 9. What function do these questions have? We would see that many of them do not have the function of assessing. Nevertheless, they may be used in that sense in particular contexts.

We would also see that the context of use is precisely what determines the function.

And so I could now say that it is essential to recover the other non-assessing functions. And put them into practice whenever designing a course.

I could also analyse the fact that there are questions that are much more interesting and challenging than others. For example, if we look at question 2 now, at least within the context in which it was formulated, it would seem almost rhetorical, with an obvious answer, only to reinforce what is being said. Although it can be helpful to show the relationship between one concept and another one seen before (function c), it does not seem to trigger any active mental process.

Question number 6 appears to be much more interesting because its answer is difficult, and probably not unanimous. Simply because there will probably appear valid questions you had never though about before.

I also like question 7, about groups. But above all, I would like to have the chance to effectively hear all answers, discuss them, then offer one myself, analyse possible contradictions… Something I would not be able to do here.

The discourse model of question 7 would be of the following type:

"What do you think about this issue? Well, this is what I think…

It is the opposite of what occurs with question number 5 (do you share the decisions taken? what other decisions could be better?) The scheme here would be:

"This is what I think…what about you?"

In a course it is very useful to include even a third discourse model:

"This is what X thinks, this is what Y thinks (etc.)…What do you think?"[17]

This opens up an enriching debate, particularly if positions are not rejected in advance. Question number 5 can lead to this if there are enough varied answers to be discussed.

As I said at the beginning, *good questions are learning tools*. The quality of our questions and their ability to start up learning processes are good indicators of the quality of our course. If our questions only served an assessment function or if they were merely rhetorical, these tools would not be as helpful. Let us make the most out of their multiple functions according to individuals, their context and the objectives we set for each case.

17 Cfr. Kaplún, 1996 and 2001. As I say there, these three question itineraries were inspired by Germán Mariño of Dimensión Educativa (Educational Dimension) in Colombia.

Chapter 7
The production process: lights, camera…!

In fact, the production process already started in Chapter 5 and went on to Chapter 6. Design is a key element to the production of a course. Only for analytical purposes, I make the distinction of this aspect which could be called "production as such".

As in every creative process, there can be many changes taking place between the initial design and the final product. Once we embark on the creative adventure, many things that were not initially anticipated can happen. For example:

- An idea which seemed to be great does not work. We create a perfect communication system but there is no convincing way of implementing it. The character we imagined does not seem to take shape, the metaphor we used cannot be understood. We cannot obtain the statements we expected, an expert who promised to come did not show up. A technical solution we counted on is no longer available. Etcetera.
- An idea we had not thought of comes up. A material we did not know about turns out to be excellent and only requires some little adaptation to suit a big part of the job. A supporting character we were going to add ends up being the main one. A new technological solution simplifies our whole work. Etcetera.

Just like a novelist, sometimes our characters "force" us to write things we would not think of in order to follow their own logic. Or, using a more accurate comparison: between a film's script and the final film there can be a large distance. Shooting and editing imply an adventure that cannot be fully planned by the script.

Moreover, there is no single production plan possible. This depends a lot on the type of course to produce and the equipment available. The process I am

about to describe is simply a general scheme, it can have several variations. Every institution should create its own processes, which will not be always the same for every course.

Better to track than to repeat

I mentioned above the possibility of finding some old material, already produced, regarding a specific topic. I did not talk about this aspect at the beginning of Chapter 5 but it can certainly affect the initial decision to prepare a course. I mean the search for other courses or materials already available that may meet the same educational needs and demands we are concerned with, or at least part of them.

Too often we find out late that there is a piece of work done which could have made us doubt of the sheer convenience of embarking on a new effort when there is something so similar available. Or, at least, take that precedent as a valuable contribution that will save us a lot of work.

Among these precedents we may also find competitors. There may be other offers that aim at satisfying the same demand or need, or very similar ones. It will be necessary to consider if what we are offering is different in some way, if it is indeed worthy to compete and if we are in good conditions to do so.

In any case, a team that begins to prepare a DL course should always start by doing good research about precedents. Producing DL materials can be really expensive and it is a shame to repeat efforts once and again. The Internet has become a precious aid to track down precedents. However, it is not always easy to find what we are looking for and the Internet has not got answers for everything. If you are not good at doing research or you do not have time, then resort to your librarian. Such professionals are usually true **experts in the search** of both paper and electronic documents.

It can also be very helpful to start building a **materials bank**, gathering together those materials produced for DL purposes and others that may be of use, including self-produced documents and public ones. (We have already mentioned simulation programmes available in the Internet). They may be available on CD, on a Web page or an Intranet, etc.[1]

1 Like the one prepared, for example, by SENAI-SC (2004a). A continental effort in this sense is the one made by the European Ariadne Foundation (cfr. Ariadne, 2000) and in general by the technologies and standards of "Learning Objects" that intend to facilitate the sharing of materials for teaching and learning among people, groups or institutions.

"Packed" or progressive production?

Once we are sure –or at least almost sure– that we are not going to repeat something that has already been done, we set out to design our course, always taking into account the four core aspects we mentioned in Chapter 5 regarding the subject, pedagogy, communication and technology. This is how we draw up our general plan for the course.

Maybe the plan already made it clear, but this might be the time to make an important decision. Will our course be fully or partially "packed"? What I mean is choosing some of these options:

- *"Packed" course:* All materials are produced before students "arrive". The course does not start until all the material is ready.
- *Non-"packed" course:* On the basis of a general plan, materials are produced as the course advances and in view of the needs of the group or groups and the people involved. It is the most similar thing to preparing "today's lesson", by taking into account what has taken place in previous classes.
- *Progressive production*. It is produced according to modules, topic units, stages, etc. When the first ones are ready the course starts and then production continues, always trying to go a little bit in advance with regards to the time in which each material will be needed. This may allow to start before and not waiting several months until launching a course. It can also be proposed in such a way that it is possible to get to know students and adapt the course to their needs, interests and abilities, like in the previous option. The difference is that we do not only prepare "today's lesson" but "next month's lessons", for example, all together.
- *"Packed" with "holes"*. A group of materials for the whole development are prepared before launching the course, but spaces are left to be filled in according to local or temporary needs. For example: local tourist information in the case of the course for taxi drivers already mentioned. Or case studies that will vary according to time or places. These "holes" allow to adapt the course to local or temporal realities but there is an important common basis that has already been prepared and that does not change. The holes are sometimes the activities that are directed by tutors who have the freedom to add new proposals and materials to the process.

As it may be seen, taking up one option or another depends on practical and pedagogical issues. The idea that every DL course is based on one package of materials that is prepared prior to the course is widely spread, but this can be rather difficult to apply and can have serious pedagogical disadvantages, since it is assumed that all learning processes will be more or less the same in any place and for any group of students and, therefore, all will be needing the same kind of support.

What relationship do you see between "closed material" (Chapter 3) and "packed" course?
Could there be open materials in a packed course?

"Writing"

The time has come to "write". I use the verb between inverted commas because the texts to be produced for a distance learning course will be varied: texts as such, audiovisual and multimedia scripts… That is, we will also be "writing" images, sounds, games, etc.

Not everyone is used to writing in these other languages, so it implies a challenge. A video, for example, is not –or should not be– a text that is then illustrated by images. Graphic material should not make use of images only as "background" that is added to the text in order to make it more reader-friendly. Images are better at saying some things than words. In both cases, it is necessary to "think in images" right from the start; or even better, think in an audiovisual or graphic way, etc. That is, being familiar with the language and its possibilities and working with it in an integral manner.

I have actually seen many educational and DL materials which do not comply with this principle. Materials where it seems to be clear that the illustrator, the audiovisual creator or the communicator in general were not present or came after the subject and educational expert (see Chapter 4) or where the four core aspects of the material are not fully articulated (Chapter 5). Communicators sometimes think of themselves as educators without having much idea of pedagogical issues. This may have apparently attractive results from the point of view of communication but they are pedagogically inefficient. Some examples:

- *Videos where the speaker talks all the time and images illustrate some of the things he says.* To overuse this resource ends up being very tiresome for the viewer because of excessive redundancy between image and sound and the lack of audiovisual narrative. Even documentaries require "telling" something and not only "talking about" something. The audience welcomes any space that arouses their imagination; that suggests associations of certain complexity. In turn, if they are "spoon-fed", they do not want to swallow. (This is precisely an example of what I have said; it forces to associate, in metaphor, the act of eating with that of decoding any "text". This type of metaphor demands more active decoding and therefore it is more interesting for the viewer).[2]
- *Videos where a person speaks non-stop in front of the camera* like a "talking statue". Unless the exhibitor is very charismatic, this will seem absolutely boring and hard to follow, particularly because it goes against our habits as audiovisual audience. Although we are not conscious about it, we are used to different shots (viewing angles and zoom), alternative views from more than one camera, etc. And we are not used to having audiovisual language working as a written text, with long conceptual discourses.
- *A comic in which all characters are only mere pretexts to put text inside "bubbles"*, together with some "dialogues". *"Have you ever heard of weather changes?" "Yes, I heard something about it." "What is it about?" "I'll explain it to you then." "Weather changes are…"* Adding illustrations about storms, desserts or tropical forests does not solve the problem of knowing how to use the means. A comic is, most of all, a story, a narrative. It requires a minimum of action, something taking place. Characters should be characters and not "discourses with faces". Of course there are great exceptions to this rule, but they are precisely exceptions.[3]
- *"Dialogues" to be heard.* Just like in the previous case, they are not actually dialogues; they are rather pretexts to present a discourse. Or they always use the resource of the wise man and the ignorant, the intelligent and the fool, the expert and the uninformed. Somebody asks something he or she does not know and the other one answers, or someone says something wrong and the other one corrects him or her. This kind of structure may cause "char-

2 For further insight on this principle see M. Kaplún (1998).

3 Such as the ones of the Mexican writer Rius, which still keep some kind of narrative.

acters" to look rather unrealistic (they do not get to be characters but schemes without a trace of human complexity). They also leave the audience playing the part of the stupid or ignorant, which can arise rejection in a more or less conscious way.

- *Games which are not to play*, where teaching is more important than playing, turning the game rather boring. Or the other way around. Questions with an obvious answer or questions which are entertaining because of their difficulty but which hardly ever teach anything. Paths on a board game where it is impossible to advance due to an excess of obstacles. The best games tend to be those that can be experienced. They introduce us into a topic and let us take hold of methodological tools through experimenting. Good strategy games are usually like that and they can teach a lot about how to organise some business activity, how to assess health risks at work, etc.[4]

"Writing texts" for DL courses is then a complex task which articulates knowledge about the subject, pedagogy and communication.

The text itself has, in addition, special formal features. Multimedia writing, for example, requires working with more columns than the ones used in film and video scripts in order to give details of the different aspects involved.

For example:

Objective	Student action	On-screen action	Button function	Connections, hyperlinks	Sound	Images

It can also be necessary and useful to have screen drafts in order to visualise the spacial distribution of the different elements (graphics, texts, buttons, menus, etc.).[5]

Usually, this stage of writing comes before the graphic or audiovisual realisation, but there may be variations. For example, when a series of statements are gathered and then a script is written by selecting part of them. Even in this case there must be a previous basic plan or a pre-script where the statements to be gathered or the topics to be studied are specified.

4 An example of this game is *Decisâo* (SENAC, 1999).

5 A format like this one was being used by INA's team in Costa Rica (2005).

Shooting and recording, editing and mounting, design and final art

Depending on the means and the language to be used (graphic, audio, audiovisual), processes will vary. But they will all demand strict technical care. Otherwise, our readers will prefer a good printed text to all our IT or multimedia displays. We are now going to take a look at the points to be borne in mind during this running stage, usually following the "writing" stage.

- *The structure of information*. With IT multimedia materials it is necessary to prepare an appropriate structure where menus, buttons and links work according to a logic that can be easily understood and nice to look at. The idea is that the reader can quickly find what he or she needs and go backwards or forwards without too many complications. In general, it will be helpful to have a general index that allows readers to find the exact point where they are within a module or a course. It will be necessary to take advantage of the hypertext by creating links that may be of use (from a certain word to a glossary, etc.). But if we are working in the Internet we have to be careful with "broken" links, which take us to sites that no longer exist.
- The general structure must definitely be part of the working plan. This also allows us to name it in a creative way, according to the communicational core agreed upon (See Chapter 5). However, this initial structure can be adjusted later, in view of the materials produced. Learning Management System (LMS) platforms –see Chapter 9– usually plan a structure pattern, which can be an advantage but can also create some inflexibility that prevent them from adapting to miscellaneous needs.
- *Programming.* Web and multimedia programming must ensure the proper operation of each element: buttons, interactive questionnaires, animations, simulations, forums, etc. Both in terms of structure or programming, LMS platforms save a lot of "handmade" work, though they can also limit the margins of manoeuvre regarding what is intended for each course.
- *Graphic style.* When graphic materials –either to print or view on the screen– are part of a series they usually have an identifiable particular style which is kept throughout the series and makes it easy to recognise: spatial distribution, typography for headings and texts, edges, vignettes, graphic elements, etc. This style should no doubt be nice and attractive, something that seems easy to achieve with information technology but which still needs the aid of

an expert. Usually, this is done only once at the beginning when templates are created to be used from then on. At the same time, each element of the series has to be different enough so that it can be easily identified among the rest. Like good magazine covers, we must make this combination between homogeneity and diversity.

- *Drawing and photography*. They both require an expert hand. It is possible to find lots of graphic material in the Internet, though it cannot always be used, either because of legal reasons or low definition quality. Screen graphics often have lower definition and they are not good for printing. Some time ago, it was easy to find graphic designers who were also good at drawing. But this is less frequent nowadays since IT design does not necessarily require drawing skills. Amateur photography, cheapened by digital cameras, can help to solve several issues, but taking a picture of some object –something we usually need to do when preparing teaching material for vocational training– often requires special light and other professional techniques. So, in order to produce a lot of materials, it will be necessary to hire drawing artists and photographers.
- *The comfort of reading.* There are materials which are hard to read on screen. Sometimes they are too long and so we need to use the bar to move downwards all the time. Other times, they are too wide, which is even more unpractical, since we must move the document horizontally across the screen once and again in order to be able to read it or see a complete graphic element, etc. This kind of problems is related to the design or the use of formats which are not suitable for screens. For example: PDF files are good to be printed, but they tend to be uncomfortable for reading on screen.
- *Downloading speed.* Make sure materials are not too heavy to be downloaded from the Internet, in order to avoid annoyed students and teachers. Not everyone can have access to a broadband and a high connection speed. It will be advisable to avoid animations when they are not absolutely necessary and to distribute too heavy materials on CD.
- *Printing quality.* When students themselves have to print some graphic material from an electronic file, quality should be taken into account. It will be very convenient here to work with formats that are page oriented, such as PDF, but not with screen formats such as html which tend to get “altered” when printed. It could be useful to offer two versions, one to be seen on

screen and the other to be printed. The latter has to preview the fact that not everyone will have a colour printer and that material should also be properly printed in black and white. Wefts instead of plains, line drawing instead of pictures, usually guarantee better results. Of course, when there is a lot of material to be printed, it is worth asking oneself whether it would have been convenient to directly print the material ourselves. Transferring printing to the user, who can always have the option of not doing so, saves time and money in terms of production, but it usually reduces the expected printing quality, which may be important for learning in many cases.

- *Recorded voice.* When recording takes place outside, there usually appear problems with direct sound, not dubbed: people whose words are hard to understand, ambient sound that is overlapped and confusing. Audiovisuals offer the possibility to include subtitles during a key and irreplaceable statement, but this cannot be done with audio material. But in both cases it is advisable to plan to have proper microphones and use them well, by looking for places or times when there is less noise, etc.
- *Acting.* Dramatising situations can be very useful. For example, to discuss the quality of services: shop assistants that serve customers, taxi drivers that chat with passengers, just like we mentioned in the previous chapter. It is necessary to make sure that acting is believable and that actors are well directed. Professionals are not always required but we should not think that anyone can do it. Good acting direction is a must, at least.
- *Sound and music.* The world of sound is vast and we should make the most out of it. Even if we do not have images, it is possible to create the atmosphere for any situation if we make proper use of music and silence. Recordings –soundtracks of audiovisuals– which are only full of words, waste several possibilities. Audio records, such as the ones produced by the BBC, can be very helpful, but it is also necessary to know how to produce sounds with old homemade techniques which continue to be irreplaceable in many situations.[6] In the same way, we must have a good music repertoire and be able to choose the right music, almost usually instrumental, except when the intention is that lyrics play a specific role.[7]

6 Cfr. M. Kaplún (1999).

7 We should also be careful here with the copyright involved.

- *Audio/visual editing.* Both for audio and audiovisual materials this stage is absolutely crucial and it is necessary to have relatively expensive equipment and expert handling. If you do not have this equipment it will be better to rent it. A video device or an editing console are no luxury but they are something absolutely essential. However, it is not justified to buy them to make three or four videos or audio records a year. Nowadays there are plenty of IT resources that cheapen and simplify these tasks; yet they continue to be rather delicate and time consuming. Editing 20 minutes of video by selecting parts of different recordings may take 20 hours…

In the graphic jargon we talk about "final art" to mean the preparation of some original piece that will be printed later on. It can be a good idea to extend this idea of "art" to the whole multimedia production work. Its artistic quality will be an essential support to pedagogical quality. It is not the same to read the illegible, hear the inaudible or look at something blur than to find some educational object that has been well designed and finished.

Validation

Before launching a course, particularly if it is directed to a lot of people, it is convenient to test it first in order to make adjustments and corrections. These tests may show aspects that are not clearly understood, insufficient time management, inappropriate operation of some aspect of programming, etc.

However, it is not easy to make appropriate and reliable validations. The ideal test should be made with materials that are just like the ones that will be actually used and under similar conditions to the ones offered in the course. Trying a "raw" video cassette, without editing, saves work but it is not the same. And re-editing the whole material, if that was the case, would be too expensive. To try a one-year course in an intensive one-month version may distort results, but to wait for a year is not always possible and it can be quite expensive.

Having previous experience in face-to-face versions of a course that will be taught at a distance may be safer.[8] This experience acts as a sort of pre-validation. But one should not be too confident about it since there are big differences.

8 This is the path taken by some institutions that have just started in this area, such as INA (cfr. San Lee, 2005).

(In any case it is important to remember again that not everything has to be made at a distance).

Some VT institutions usually start by testing courses "at home" or at least they make sure that some of their members take part in the first experiences.[9] These first experiences can be more limited in terms of number of participants before making them more open. Of course this is not always possible: a compensation course on reading and writing will hardly ever have any participant from the institution itself. When it is possible, however, it is indeed advisable to try oneself what we are offering to others.

Prior validation will be more necessary in the case of "packed" courses. When we produce as the course develops, it is possible to correct errors as we move on. If there are no reliable validation possibilities, this can definitely be taken as an option.

Publishing in the Internet age

On the one hand, it is still necessary to publish on paper. Not everything can be read on the screen and it is not always convenient to transfer printing to the student, because of costs and quality problems. That is why several educational materials continue to be published on paper.[10]

When the material to be published has sound or is audiovisual, then it will be necessary to resort to other means: audio cassettes, video cassettes, CDs, DVDs. CDs offer many advantages: it is possible to include texts, fixed and moving images and sounds, we can copy them in a "homemade" way , without affecting quality. This has made them more and more popular. However, in some cases there are other means that can be more appropriate. For example, video cassettes are still ideal to guarantee image quality and are easy to use for students. For texts on CDs, we can apply the same rules as for on-screen reading.

Finally, publishing in the Internet offers great economic and practical advantages. It saves time and money since it is not necessary to make copies (a unique "copy" can be used by all students) and it allows to correct and change

9 This emphasis was mainly suggested by the responsible team of SENAI-SC (Brazil) and SENA (Colombia) during our conversations in December 2004 and February 2005, respectively.

10 SENAC, in Brazil, for example, keeps its "paper" editions very active, as it was explained to us by its responsible team during our conversations in December 2004.

contents at any time. Various systems and even LMS are also making publishing available to anyone, without the need to have any specialised staff to "upload" or "submit" materials.

Internet allows to publish both texts and images and sounds, though it has some limitations. We have already mentioned the fatigue of reading texts on screen and sometimes the size of graphic, sound and audiovisual files limits access. Even if we have a broadband, there still are no quick and quality video systems in the Internet.

On the other hand, savings can be deceitful: servers that can bear a lot of material and many similar accesses have high costs. That is, not everything that is published in the Internet is free. Nor is everything we read: access also has a cost.

As a result, it is often necessary to combine more than one means, by publishing some materials on paper, some on video cassette, CD or the Internet, even for the same course. In some cases, this forces us to introduce a new element to the publication: boxes or cases to pack all those elements together.

In the case of paper printing, one should be familiar with the pre-printing (matrix, sheets, plates) and printing (offset and rollers) systems and the paper to be used *before starting to design*. Colours and complex images will not be well printed without significant investments in both processes and in good paper. High pre-printing expenses (sheets and plates for four-colour printing, for example) in particular are justified after a certain minimum of copies (hardly ever less than 500). Small print runs (less than 100) can be improvised with semi-artisan print systems, such as office printers. Nevertheless, this can be rather time consuming and quite expensive.

To produce video cassettes and CDs it is also necessary to have some part of paper printing – labels and cases. We can apply the same tips as the ones I have mentioned above.

What criteria does your institution follow to print some materials on paper and others not?

Informing and attracting students

There are times when it is almost unnecessary to advertise a course. It will be enough to send some e-mails, publish it in the Internet and that will do. This takes place when the potential interested people are only a few who can easily be reached and when they are very motivated and attentive to information about courses. Other times it requires a rather big advertising effort, not only to spread the word but also to attract students: doing a course is something they have not thought about before and they are not too motivated to attend one. If the course also has to reach a large number of students to justify the investment in preparation, it will be even more necessary. The costs this aspect implies are not always well reckoned. Whether it is with mass advertising or through selective e-mailing, mail brochures or advertisements on specialised magazines, this stage should be well thought, prepared...and budgeted.

If the course was prepared in a careful way from the start, with a good idea of the potential participants, then we are way ahead. If a market study was also made, even better. This starting point facilitates preparation:

- The main call: Who are we calling? What will potential participants find appealing?
- What means and channels will we use?
- How will the "sale" be settled?

For the first aspect, the name of the course will not be a minor detail. A good name should be easily understood by the target audience, it should provide enough information about the course and, if possible, it should be appealing, interesting. This cannot always be achieved by the name itself and it might be necessary to ask advertising to do so, for example a slogan or an image.

SENAC's course for taxi drivers (2004), which we mentioned in previous chapters, was called "Quality in tourist service for taxi drivers". It may not be a very interesting name but it is comprehensible and it succeeds in informing what the course offers. SENAC's team understood that it was necessary to show that this improvement in quality when serving tourists implied concrete benefits for taxi drivers. A teacher could find it appealing to improve the quality of his or her work, even if it does not imply an economic reward. In this case, however, that is not enough. The chosen slogan of the course's advertising was then "Taxi driv-

ers who get As do not sleep at the rank".[11] A slogan that expresses economic profit in an interesting way (by triggering an "active decoding") which is easy to understand by the target learners: sleeping on the taxi rank for not having customers is an everyday situation that only those who live it know what it means.

What are the names of your courses?
What slogans have you used to advertise them?

The means and channels to use will mainly depend on two variables: the cost and the target audience. Good advertising agencies are usually experts in planning advertising investment in order to maximise it. Although TV advertising may seem the safest option, it can also imply an extremely big expense, and a good part of the effort reaches the wrong audience. On the other extreme, we have direct promotion actions at places and events where our target public is concentrated. They can have a relatively low cost and reach directly our target audience.

We should no doubt include some key information (starting and finishing dates, for example). In addition, we should include the way in which potential participants who decide to take the course –or who want more information to make up their minds– can contact the institution and enrol. Manners, places and schedules to access information and enrol (telephone, Internet, in person) should be clearly advertised. And they should be certainly previewed…

In the case of SENAC's course for taxi drivers, they chose to produce ads for different media but they asked each regional office to fill in the gaps for information and enrolment and the choice of means, in the understanding that it was better that both aspects were solved in a decentralised way.

Enrolment and selection

There are several processes involved here: enrolment as such, register and data processing of the enrolled students, selection and collection of enrolment fees and monthly fees, if applicable.

11 In Portuguese: "Taxista nota 10 nâo dorme no ponto".

Enrolment procedures have simplified a lot with the use of the Internet. But access problems are still a big barrier and it may be necessary to plan other options. Online enrolment also has security risks. We can also be filled with false enrolments,[12] particularly if there is no charge or if the payment can be delayed.

Whatever the modality chosen, e-mail, telephone, Web form or in person and with papers, it is a task that takes some time, dedication and resources as well as implying expenses. An essential thing to do would be to start building a database of students enrolled which can later offer basic information about them, facilitate selection if that is the case, create mailing lists for notices or for the course itself, etc. LMS usually plan and facilitate these administrative issues.

If participants will be selected, then it is important to express the selection criteria in order to avoid future complaints from the ones that have not been selected. This can also be a hard task that must be thought of in advance, particularly in massive courses.

When enrolment implies charges for the student, the whole mechanism becomes much more complex. Credit card payments via Internet are not considered safe by everyone and not everybody has that chance. Collecting also has some charges…

I have probably said something obvious, but it is worth repeating it: the administrative issues of courses cannot be overlooked.

Distributing is never for free

This cost and time should be planned ahead: distributing books, videos, CDs, etc. Sending many materials at different times tends to be relatively more expensive than just sending all the material at once. This may be an economic argument in favour of fully packed courses. But there are good pedagogical and practical reasons to choose other options, so it will be necessary to plan more than one posting in many cases. Many institutions already preview distribution channels; others need to make a special organisational effort.

The Internet also saves time spent on distribution: it would just be enough to send one e-mail or publish the material on the Web to make it available to

12 As we were told at SENA in Colombia, in their first experiences, and before correcting a series of problems, they received several “enrolments” under names such as Batman or Batgirl…

everyone. If volumes are not very big, including this task does not imply further costs, on the contrary, it makes the most out of the already available infrastructure in many institutions. But if materials' volume is very big, and, especially, if there is a large number of students, then it may be necessary to have new servers that may bear all that weight at the same time. As a result, costs will rise.[13]

Teacher and tutor training

When teachers or tutors[14] –or part of them– have not participated in the process of production, then we should plan some specific training work for the staff who is hired by the time the course is about to start.

Expert teachers or tutors will not need more than support handbooks. Others may require courses or training days in order to learn the methodology, understand the characteristics of this kind of work and become familiar with the course's contents. Resources –and time– for this kind of training must be planned ahead enough for it to be ready at the time of starting the course. It might be necessary –though not always convenien– to progress in that sense even if not all the materials are ready.

Some institutions have prepared brief "induction" materials that are a quick introduction to this learning method and the use of technology. Materials tend to be similar for tutors and students,[15] with the corresponding differences of each case. Others have developed long courses about "distance learning on distance learning" (SENAC, 2002), which also introduces the new method to those who have never worked with it.

In the same way as with students, it will be necessary here to "get to know Peter" not to teach him Latin but to help him teach Latin to others… and doing so at a distance and with NICTs. Being familiar with their social and cultural characteristics, their previous training and experience, their access to technology, etc. seems absolutely necessary. At least, an effort should be made to preteach from the common knowledge we all have and the conversations we have

13 SENA in Colombia, for example, had previewed for the year 2005 a cost for renting servers that was equivalent to two US dollars per student. Given the estimated number of students, it implied hundreds of thousands of US dollars in that area.

14 The following chapter clarifies this distinction, which is not usually applicable.

15 Cfr. for example, SENA, 2005.

with them. It can be, though, a precious investment for more in-depth research (cfr. Braga and Pereira, 2004).

I will come back to teachers or tutors in the following chapter.

Launching, continuous assessment, re-editions

As I have said before, it is possible –and advisable in many cases– that the course begins with a face-to-face meeting. This can be a good time for introductions, clearing up practical doubts, forming teams, etc. It can also be useful to detect possible problems and adjustments to be made.

The course will develop, it will take more or less time and then it will end. If it is a short course, then there may be only one final assessment; if it is longer, then it is better to have evaluations in the middle. In any case, particularly during the first experiences and the first days of each course, the team will have to make constant evaluations in order to detect and correct problems and mistakes. Every educational process should never leave all assessments to the end. This is particularly relevant in this kind of course.

Of course there will be a final assessment that will allow to plan possible changes in future course editions.

When all materials used to be printed, these changes were usually long postponed. Although the ideal thing was not to spend more than three years without updates, it usually took much longer to introduce changes. Electronic means welcome changes at much lower costs since money can be saved in terms of publications. Redesign, rewriting, new shooting and recording, editing and mounting, graphic design and final art are all the same as before and they continue to be very important. That is why it is not so easy to make many changes for every new edition, particularly in the case of “packed” courses and courses without “holes”.

Production times

How much time goes by between the initial decision to design a course and the time we can begin to enrol students? This will basically be dependant on three variables.

Course length. It is obviously not the same to prepare one module of 10 hours than preparing a 500-hour course.

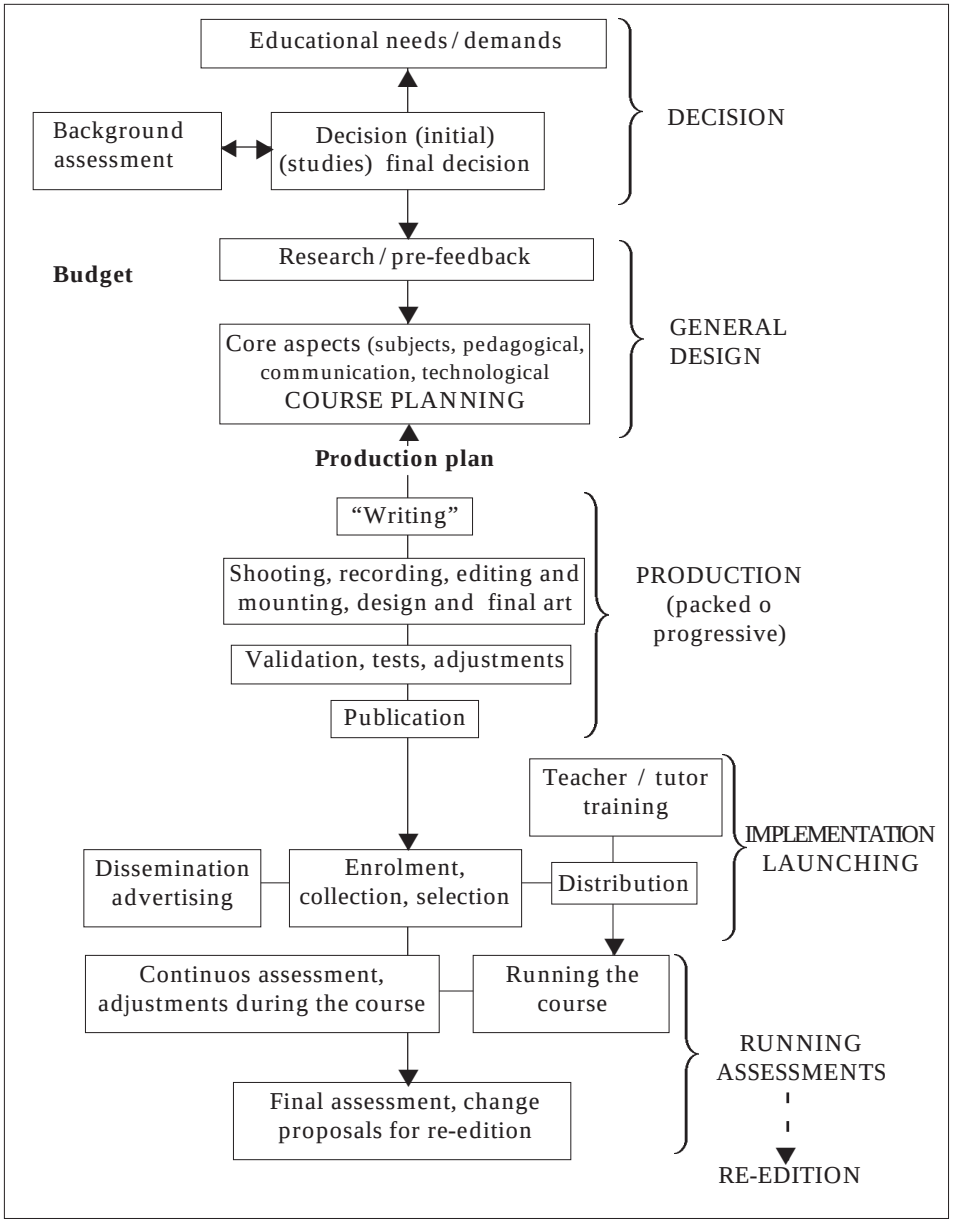
Size, availability and experience of the team. Preparing a distance learning course takes, at least, ten times more time than a regular classroom course.[16] That is, if preparing one hour of a face-to-face lesson for a new course which has never been done before can take at least two hours, then that preparation will at least take 20… and some even risk to say at least 100. Although this may sound too exaggerated, it is not if one thinks of all the processes and people involved, in contrast with what happens with a course in a classroom setting that can be prepared and taught by only one teacher. At least at the beginning, when the team is not in shape yet, it is possible that more time is required. This will reduce as the course develops.

For the example, in a 10-hour module, there will be no less than 200 hours –and hopefully not more than 1000– of preparation. A highly specialised team will probably come closer to 200 hours, and an inexperienced one will probably reach 1000 hours. If the team is made up of four people who can devote 50 hours per month to this task, the work will take them between one and five months. If the team is bigger and can devote more hours to preparation, then times can be significantly reduced.

The packed nature of a course. A fully packed course has to be totally ready soon before enrolments begin. It might be the case that even if courses are relatively short, 20 or 30 hours, several months go by before being able to start enrolments.

All these factors explain why many VT institutions plan between six months and a year from the initial decision to make the course to its launching, depending on the length and complexity of the course. None of them plans less than three months, at least the ones we consulted for the purposes of this book. Even with courses of progressive production, it seems to be the minimum necessary time before starting.

16 Cfr. De Moura Castro (1998), Rumble (2001).


Educational needs / demands
Background assessment
Decision (initial) (studies) final decision
DECISION
Budget
Research / pre-feedback
Core aspects (subjects, pedagogical, communication, technological
COURSE PLANNING
GENERAL DESIGN
Production plan
"Writing"
Shooting, recording, editing and mounting, design and final art
Validation, tests, adjustments
Publication
PRODUCTION (packed o progressive)
Teacher / tutor training
Dissemination advertising
Enrolment, collection, selection
Distribution
IMPLEMENTATION LAUNCHING
Continuos assessment, adjustments during the course
Running the course
Final assessment, change proposals for re-edition
RUNNING ASSESSMENTS
RE-EDITION

Planning production

The above diagram tries to show the whole production process, by grouping the different activities in big phases or stages. The stages of decision and global design are developed in Chapters 5 and 6. The rest corresponds to this chapter. It also makes a difference between "production as such" and the running of the course, with an intermediate stage of implementation and launching.

As it may be seen in the diagram, the complete process can be long and complex. It implies many activities and tasks that must be coordinated. At the beginning they may all be developed by a single team, but other teams may also participate. For example, large vocational training institutions with a wide geographical scope can have some tasks done in a decentralised way. It will be necessary to establish clearly who will be responsible of what, by using charts as the following:

Phase	**Person in charge**	**Assistants**	**Time** (months)
Decision	Central team (CT)	Local teams (LT)	1
General design	CT	LT	2
Production	Local team 1 (LT1)	LT	4
Launching	LT	LT	2
Running	LT	LT	3

Of course, it will be necessary to disaggregate this chart even more, with the activities that correspond to each phase and even with the tasks implied by each one of them, assigning specific responsibilities and more precise times, in weeks or days.

Some tasks and activities are, in addition, simultaneous, so schedules will have to account for that. For example:

Meses / Phase		1	2	3	4	5	6	7	8	9
Decision										
General design										
Production										
Launching										
Running										

This schedule has taken the production times of the previous one. But we have now opted for a progressive production.

How long would the process take if we opted for packed production?

The budget

Once we have a precise production scheme, then we can start preparing an accurate budget. Nevertheless, it is clear that we will have to have a reasonable approximation at the time of making the decision. That is why we included it in that part of the diagram. We should go over this initial reckoning at the time of preparing the production plan. If it is no longer possible to obtain more resources, in the event that they are now considered necessary (which tends to happen quite often), the plan of production itself should be revised in order for it to adapt to the available resources.

If we are able to prepare a budget, it enables us to anticipate the best way of doing things in the future: the types of materials to be produced, the potential number of students and tutors that will be required, the advertising needs, administrative expenses, etc. Chapter 10 offers some suggestions and criteria for budgeting.

Chapter 8
Teachers or tutors?
From educational Taylorisation to pedagogical creativity

Authors and tutors

DL systems usually use the term tutor instead of teacher or professor. Many of the functions developed by a teacher in face-to-face education can be divided into at least two different roles: the role of the author and the tutor.

The author –or very frequently, the authors– is the one in charge of preparing the contents of a course. That is why some call them "contenidista" (content-compiler) (Campos, 2002). Tutors, on the other hand, are in charge of providing direct support to student learning. In packed courses these two roles also correspond to different moments: authorship corresponds to the stage of production, and tuition to the course's running.

Other roles can be added, both for authorship and tuition. For example, many DL systems have a course director or coordinator. Usually their main role is more on the authorship side. They are in charge of coordinating different authors and the multidisciplinary production team (the four musketeers of Chapter 4 and many others that can be necessary, according to the type of production). Sometimes it is better to divide the direction of authors (or "content-compilers") from the operational coordination of the team.

Directors may also assume the coordination of the running phase or at least take part in the training of tutors. But other people can be in charge of coordination during this stage. In tuition there are also other roles, such as that of "monitoring" (Döding, 2003). Their main function is to support students, not while learning contents but rather in the operational aspects of DL systems and the technologies involved, by solving the problems they may come across in this area. They can also offer support to tutors themselves in this sense.

Although there are several variations, we could say that there will be two big types of roles:

Production	**Running**
Director – Coordinator	Monitor
Author / s	Tutor / s

According to this scheme, students will have a direct relationship with tutors and monitors and an indirect one with directors and authors. The last two will provide them with the design and the "texts" but they cannot interact with them.

This scheme has several important advantages. For example, it enables renowned teachers to contribute with their knowledge in a course that will be taught to many people. They would not be able to teach so many students, but they can indeed prepare –with the support of the multidisciplinary team– some of the materials for the course. Tutors will be in charge of supporting students in the learning process by specialising in this kind of support and "relieving" them from their concerns about contents.

However, this task division also has some disadvantages. On the one hand, it keeps the author away from students and their learning processes. So it may happen that the author's contribution is brilliant from the conceptual point of view, but not so much from the pedagogical perspective. The multidisciplinary team can solve this in part.

This system also disconnects the tutor from the design and production processes. The tutor may feel –and actually it is often the case– like a simple "executor" of a course that others designed and an executor of what others have planned. The more packed a course is, the more they feel like that.

This "Taylorisation" of teaching, where some plan and others execute, may not be very motivating and may even discourage good teachers from working as tutors since in DL they feel they lose their position. Some because they feel "their place" was mainly passing on knowledge; others because they feel that there is not much margin for creativity, or because instead of having a personalised way of learning and an adaptation to each group situation, this kind of work standardises teachers' and students' activity.

That is why many DL systems have reconsidered this adamant division between authorship and tuition. And they simply begin to recover the idea of the "teacher": that is, someone who has the ability to both transfer contents –but also

to suggest good readings by different authors, of course– and to aid learning. Many authors get involved in tuition and many tutors in authorship. Or effective exchange instances are established.

In too massive courses, it is more frequent to have a disconnection between these two roles. As many authors will be required, it is possible that not all of them are able to take part in authorship. A good and motivating solution for tutors are production models with "holes" that can be filled in by tutors' own ideas –or at least with materials they selected–, in accordance with their knowledge of the groups and the people they are working with, of their learning processes and knowledge acquisition. They will further include the production of knowledge by their students in this process and eventually they will share them with the rest.

That is, a good tutor will be, above all, a good teacher: a facilitator of learning and not only a mere transmitter of contents (cfr. Maggio, 2000). Even simpler: a tutor ***is*** a teacher. It is worth insisting on this. Therefore, from now on, I will use both terms together or indistinctively.

The tasks of the tutor/teacher

How many students can a tutor manage? It depends on the kind of course, but, on average we could say that the same number a teacher is able to handle well in a face-to-face course. This may vary between twenty-five and fifty students per tutor according to the different institutions and systems. In fact, experience indicates that in good distance learning courses the tutor has even more work than in face-to-face courses because students may demand greater personalised attention. Therefore, to handle a group with two weekly hours of class, the tutor must have eight hours.

What tasks are usually done by tutors? It depends a lot on the type of course, the extent to which it is "packed" and the openness or closeness of materials. The less packed and the more open a course is, the more tasks the tutor will have. For example:

- Organising activities. Reminding students of pending tasks.
- Organising groups and promoting exchanges among them.
- Designing and suggesting activities that are not included in the materials.

- Suggesting readings or additional activities (to all students or some of them).
- Answering questions, doubts, enquiries.
- Running debates in forums, with questions, challenges and summaries.
- Organising and coordinating face-to-face meetings.
- Assessing and commenting on students' work.

In more packed systems with less open materials, tutors tend to concentrate on answering questions and assessing papers (and sometimes not even this, which is handed over to coordinators). NICTs added the idea of promoting other kinds of interaction, not only between each student and the tutor but amongst students, for example, in forums, chats or mailing lists. However, the recovery of groups and the combinations with attendance had already begun.

Answering questions, running debates, managing group work and face-to-face sessions are particularly important tasks which I will analyse more deeply.

Good questions and better answers

There are several types of questions and many ways to answer them. The kind of questions that want to be elicited and the kind of answer the teacher provides can be decisive in learning processes.

I have already dealt with questions posed by teachers and based on the material or tuition in Chapter 6. Now I want to consider students' questions.

Students' questions may show, for example:

- Lack of reading, work or attention.
- Lack of prior training.
- Lack of information or comprehension problems.
- Search for conceptual links (for example: between one content and a previous one).
- Search for links to experiences, practice, professionals, etc.
- Disagreements with the point of view of the material or the tutor.

What do you tend to do as a teacher when you face each of these situations?

Of course there is no single way to answer to all the cases. But some general criteria may be of help:

- *Our answer should always encourage learning and not discourage it.* For example, if the question shows lack of reading, sheer recrimination ("you do not seem to have read enough") cannot always be helpful. Without ignoring this fault, we should think about how to really stimulate reading and express how useful it can be. You should also bear in mind that you do not have enough time to read when you are playing the role of the student... "I know it is hard to do all readings, but there are some which are particularly handy. For example, text X can help you understand better this problem".
- *Appreciate good questions.* Let the student know that and share the question with the others if possible. Learning is most of all built upon good questions and not only the already given answers to non-posed questions. To stimulate doubt methodically also helps stimulate learning. He who does not doubt, does not make himself questions, does not learn.

Questions that look for connections are particularly enriching since they allow to draw up conceptual maps and guides to actions. They can be conceptual links. "Is this related to...?" or "What is the relationship between this and that...?" There could be connections between experience and practice "How can this be applied to this situation…?" or "Is this what happens when…?"

This kind of questions is what the own teacher proposes. Take a look, for example, at this case from the previous chapter:

What relationship do you see between "closed material" (Chapter 3) and "packed" course? Could there be open materials in a packed course?

Even a student could have posed these questions, although in a different way: *"Is packed the same as closed?"* Even you as a reader might have asked yourself this question when the term "packed" first appeared.

Questions that show some disagreement with what materials or the tutor says are also very good. Unfortunately, only a few students dare to ask these questions. If they come up, then it means there is educational health. Repressing or censoring them does not seem healthy.

We are now going to consider the case of typical questions, those which show comprehension difficulties or lack of information. What can a teacher do when faced with this kind of questions?

Answer, one could say. Provide a direct and straight-to-the-point answer to the question posed. No doubt it is the simplest thing to do and sometimes the best thing; particularly, when it concerns about information that had not been given so far. It is not so clear when the question shows comprehension problems. Some other possibilities may be better or supplementary. Instead of or in addition to "answering", we can:[1]

- *Explain the grounds* of the answer. Take advantage of the question to find the answer in a larger conceptual network.
- *Analyse the question*. Explain the constructive ideas that support it. Use it to explain the conceptual conflict implied in the answer. Re-asking the question by making another one that is broader in scope.
- *Compare questions* or stimulate students to do so by *organising* them according to useful categories in order o articulate a group of related concepts or procedures. For example: questions such as: what?, why?, what for?, how?...
- *Throw the question back to the student or the group.* In this case, we can also compare answers later and offer our own answer as well. This may "avoid" some of the conceptual confusions that may exist, which tend to persist a lot, even after a long piece of work, since they are the result of long-standing preconceived ideas. Or it may be a good chance to show that there is no single possible answer, since the subject is controversial or the problem accepts several solutions. In order to suggest strategies to search for answers in an autonomous way, it is advisable to suggest additional readings or activities.

  It is true that not answering and throwing back the question to students is sometimes the strategy used by teachers who do not know the answer, and find themselves caught unarmed by a student's question. Distance work, when it is asynchronous, allows to hide that since there is time to look for the required answer or clear up a doubt one may have. Nevertheless, it can be more honest and pedagogically saner to admit one's ignorance or share one's doubts. This could be done by committing oneself to look for answers and bring them back later but also encouraging the group to do their own research.

1 I mainly follow Maggio's suggestions on this issue (2000:43).

As it may be seen, there are several ways to ask and several ways to answer. We suggest the following activity:

- Choose some unit from the distance learning course you have already worked with, or a classroom-based lesson if you have not yet work at a distance.
- Write down the most frequent *questions* students make and group them according to what they try to say.
- Classify the *answers* according to the categories you established and see what other type of answer could have been possible.

It is a good practice to develop with other colleagues: compare types of questions and answers and discuss the teaching strategies that could be derived from them.

Promoting exchanges and debates

The possibility of exchange "among everybody" offered by NICTs is one of the most appealing features to be adopted by DL. However, we usually receive complaints that forums do not work or are rather poor.

One of the reasons appears to be technological. In the case of chats, it is also frequent that when there are too many participants there appears some sort of frustration because no coherent dialogue can be established: when somebody answers to somebody else's intervention, a new one already appears, and so on… Forums do not have this inconvenience and they allow to put an order to the debate. However, they usually require being online, which may be a serious barrier to many students. Mailing lists may avoid these problems and adapt better to many people's IT habits; they do not have such order, though. The search for Web-like solutions offline can be an appropriate way to solve both problems (cfr. López, 2004). In all cases, tutors may help students handle technologies and stimulate their use, etc.

Another possible explanation of forums' scarce or poor usage is of a pedagogical sort. Here is where course design and the work done by the tutor teacher are decisive. It is not usually enough to invite students to participate in forums,

it is necessary to organise them well and promote them with questions and motivating activities.

Some systems resort to the idea of compulsory components and thus participation in forums is part of students' assessment.[2] I believe this may be appropriate if the question or task proposed is really interesting and collective. If it can be substituted by an individual task or if it is like "come to the board and answer each question in front of the class", I think it goes against the pedagogical approach we developed throughout this book.

We are going to look at some interesting activities for collective interaction spaces, such as forums, lists or chats.

- Make students' *constructive ideas*[3] explicit. This is useful before presenting the course's proposal on a certain subject. It will then allow to go on discussing ideas and confront them with the ones offered by materials and/or the tutor. One can easily promote an exchange by asking "what do you understand by…?" Or if it is a procedural concern, "what do you do to...?"
- *Discussing* different positions regarding a subject. To do so controversial issues could be presented. Or else, previous individual or group work can be organised with students; each of them must take one position and find arguments to support it, even if they do not share it. This allows to go over the arguments in favour or against a particular issue.
- Discussing *cases* or *problems* that may be suggested by tutors or by participants themselves. Discussing concrete situations may be more motivating than talking about an abstract topic and it allows to put in practice several theoretical or methodological tools.
- *Sharing knowledge and experiences.* This is particularly important in the case of adults who are already working. Learning communities are formed around the exchange of knowledge among their members and not only with what comes from the outside. Stimulating this exchange and critically appreciating one's and others' experience will be helpful beyond the specific educational environment.

Going back to technological aspects, multi-point videoconference[4] could be

2 This is the case with several of SENA's courses in Colombia, according to what I was told by the people in charge.

3 For further information, see Chapters 3 and 5. See also Kaplún, 2004 and 2005.

4 I mean videoconferences in which several groups from diverse places participate, all of them with the chance of interacting with the others.

used as a main or complementary means in a distance learning course and work as a space for debate if it is correctly used. Having group work at every place that is connected would be useful to do so, though it is necessary to have local tutors. Group work can also be done offline, thus saving costs.

It could be a good idea to combine individual student exchanges with exchanges between small course groups. For groups to contribute to the debate, it will be necessary that someone acts as a spokesperson and shares a summary of the work done collectively.

Encouraging group and face-to-face activities

I have already dealt with the issue of forming small groups in Chapter 6 and I will refer to that now. It should be enough to say that both group formation and permanence highly depend on the tutors' work. When forming the group, they must help to do so in the most appropriate way and with clear tasks. For the group's permanence, they can help them to face and solve the conflicts and hurdles every group goes through, both in its internal dynamics and its task. Without sound tutorial support, groups run the risk of dissolving or becoming frustrating spaces where no progress is made in the task.

Right from the start and throughout this book I have referred to face-to-face meetings and their convenience. During a face-to-face meeting many things can be done, according to the work stage and group needs:

- Knowing students' expectations, their interests, realities and previous ideas.
- Meeting all members of the group, "becoming" a group as such, will facilitate future relationships at a distance.
- Making working teams (which can continue to work as such).
- Doing work that requires equipment students do not have or cannot learn to operate at a distance (for example manual tasks).
- Clearing up doubts, discussing conflicts or differences, finding solutions.
- Contacting experts on the course's topic (teachers and others), being able to listen to them, asking them and debating with them.
- Sharing experiences and knowledge among participants, starting debates that will be followed at a distance.
- Evaluating the course's development; assessing the course collectively.

- Sharing and assessing products and results of individual and group work.

In order for any of these tasks to be done, it is necessary to have some previous organisation and a coordination that does not lose sight of the objectives and that is also attentive to what comes up in that moment. Apart from being a good chance for other experts to participate, coordination will mainly be a task done by tutors or a general course coordination that is very linked to tutors.

Tutorial teams, training and teachers' distrust

Stimulating student group work should go side by side with teacher team work. At least we should provide spaces where we could share working styles, problems and ways to solve them, materials and assessments about the courses' development. In order to do so, forums or mailing lists can be created and regular face-to-face meetings can be called.

Another interesting possibility is *tutorial classrooms*, where tutors of a particular course or different courses work with their groups on a computer, by phone or in person.[5] There, other formal and informal exchanges can take place and some common problems that may arise can be solved together. An expert coordination may support tutors and their on-the-job training itself. It frees the tutor from having his own IT equipment (and its maintenance and connection) and it establishes a clear timetable for his work, something many tutors appreciate.

These spaces may, in addition, be ideal for specific tutor training activities. Tutor training is, above all, pedagogical training, which good teachers have supposedly already received. But it is usually necessary to supplement it with specific tools for distance learning work and the use of the corresponding technology. In the same way as students often need an introduction to the work in virtual environments, teachers will also need it.

It is true that many teachers cannot adapt or reject this kind of work. This has sometimes led to looking for tutors among people with little training or teaching experience but who are more willing to work at a distance and with NICTs. However, I want to insist on the point that if the tutor is a teacher with no training or pedagogical experience, results can be pretty risky.

5 A working method that was adopted, for example, by SENA in Bogotá.

It is also said that "traditional" teachers (face-to-face courses) cannot adapt to a situation where their main role is not to transmit knowledge. As I see it, this is not a problem of being face-to-face or at a distance, using a whiteboard or a computer, but rather an issue of the *pedagogical approach*.. E-learning can also be approached as a means to transfer knowledge, as I mentioned in Chapter 3. When I say that a good tutor is a good teacher, I mean, once again, a teacher that regards himself mainly as a facilitator of learning.

Of course there are long-existing technophobes, people who do not trust computers or any sort of technology. Or people who simply cannot adapt to them. It is also true that some "*techno-euphoric*" discourses which announce educational revolutions after the sheer appearance of computers are also suspicious.[6]

I think that many teachers' suspicion regarding e-learning is not so much directed to technologies but rather to reducing their roles to "*course executors*", as I have explained here. If they are indeed reduced to this role –as it happens in some systems–, their suspicion will be justified.

Other reasons which may lead teachers to have doubts about DL with NICTs are the following:

- *Work overload*. Longer preparation time –if they are involved in authorship activities– and attention to students, who may call them at any time or fill their inbox with e-mails. And, in general, time to adapt to the new educational method.
- *Extra costs.* Usually they must take up the costs of their equipment, its maintenance and connection. It is like hiring a messenger with his own scooter but without realising he must maintain and recoup the cost of the vehicle, fill the tank, etc.

Both things can be solved with *extra payments* which can make up for time and expenses. But then teachers of face-to-face courses in the same institution may be upset with that measure, since they do not understand such difference. "They work without moving from home and they even get paid more…"

A tutorial classroom or at least working with the institution's equipment at its premises may help to solve some of these problems. But in any case, they must be anticipated as part of the institutional resistance to such a big change as this one.

6 For further information see Kaplún, 2001a.

Finally, we have to be careful about the possible *cheating and frauds*. Traditional distance learning systems have a history of tutors who are supposed to pay a visit to groups and never do so, consultancy hours which are never respected, etc. With tele-working it can still be worse. If a tutor never answers questions or runs debates, it can be harder to detect it.

LMS platforms allow to verify the amount and connection time of tutors and even supervise their interaction with students. But this may cause unrest among tutors, so we should be careful about the way in which these resources are used, so that they can be taken as support rather than surveillance. It is also true that they cannot account for telephone and personal queries.

When faced with possible non-compliances, it will be required to make due controls; students do this in part when they are given the opportunity to assess tutors; and coordinators, monitors, etc. do so as well. But, above all, it will be necessary to insist on motivation and training. Bad teachers of face-to-face courses also "cheat": they are often absent, they do not prepare their lessons properly, they are hardly ever available for queries, etc. If a good tutor is a good teacher, then it is true that a bad teacher is usually a bad tutor. And no one is safe from bad teachers…

Most likely, the less Taylorised tuition work is and the more chances there are for creativity, the more tutor teachers will be involved and committed to their work.

Chapter 9
Technological options: guides inside the NICTs' labyrinth

Let us make a "small" preliminary list of formats, means and technologies:

- Whiteboards, easels, transparencies, slides, projects for computers…
- Different texts: printed, photocopied, sent by e-mail, published on the Internet, hypertext...
- Audio and video, cassettes, CDs, DVDs, the Internet, compression, streaming.[1]
- Video and computer animations.
- Simulation devices, graphic simulations for computer.
- Written press, radio, television, Internet press, radio and television.
- Basic phone service, cell phone service, Internet phone service.
- Multimedia CD (texts, video, audio, animations, exercises), hypermedia.
- Tele and videoconference, uni- and bi-directional, bi- or multipoint, by telephone line, satellite or the Internet.
- Computer-mediated communications (CMC): e-mail, distribution lists, chats, video-conferencing, news groups, collaboration software.
- Computer-based learning, self-learning software, tools for network cooperative learning.
- Copyright software to produce courses and contents, to manage courses, to manage courses and contents (LMS and LCMS).[2]

Which of them do you know and are you familiar with? Which others do you know?

1 Technology that allows to play (though not to burn) audio or video without the need to download the whole file in advance; it downloads in batches.

2 *Learning Management System* and *Learning and Content Management System*.

Maybe by the time I write this and it reaches you, new technologies will have appeared or variations to them. In many cases the "new" stuff has mainly to do with the technological support that is used and not with the language or the format. Images in motion, whether in a celluloid, television, magnetic video or digital film, have many aspects in common, but they change the possibilities of production, distribution and use. A good part of IT and the Internet development has been based on text. And the hypertext retakes and largely multiplies the notes and reference systems of the traditional text.

In view of all that variety, I do not intend to talk about each technology and its characteristics. What I will try to do is to offer criteria to guide oneself in this technological labyrinth and take some rather sensible decisions. I trust that you will include a specialist on these technologies in your team.

Assessing technologies

When should we decide what technologies to use? As I see it, the general rule is the following: the decision about technologies should be based on pedagogical design and not the other way around. I already tried to show in Chapter 5 this prevalence of the pedagogical core within the design of a course.

It could be said so that the technological decision comes after the pedagogical concerns, and to some extent it works like that. However, as I also mentioned in Chapter 5, the available technological possibilities in each case open and close doors which, even if they do not change central pedagogical options, they can affect or bolster working methods and expressive and communication possibilities.

For example: having a good system of forums and tools of collaborative work will facilitate an already taken decision for a course which intends to promote interactions and group work. The unavailability of these tools does not prevent us from doing it anyway, by looking for "homemade" alternatives. For example, making "forums" with mailing lists. It will not be so easy, however, to include videos if we do not have enough resources. We may be able to include short and very simple videos made with a home camcorder and even with a Web cam. But something more complex requires other technological resources and experts to handle them.

What should not occur is that technological "solutions" turn into pedagogical problems. For example: many development programmes and course administrations plan a main assessment methodology –and sometimes the only one–: multiple choice questionnaires. As I have already said in Chapter 6, they have some important limitations as assessment tools. And the way in which we assess also affects the rest of the pedagogical options. It seems that many of these programmes have been originally thought from a behaviourist pedagogical perspective. Although it is possible to use them from a critical-constructivist perspective, for example, we should not be "taken by" its pedagogical "suggestions" without much thinking.

But what do we mean by "available" technology? It implies at least evaluating the following aspects:

- *Is it within our reach to obtain it and pay for it?* I mean the initial decision but also maintenance, updating and renewal, which may result in significant expenses.
- *Is it within our reach to use it?* For example: it is not enough to have equipment for video recording and editing if there will be no one that knows how to handle them well or money to pay for the work hours implied in producing good videos. This is one of the reasons why many educational institutions tend to be technological cemeteries of equipment that was once bought and almost never used.
- *Is it within the reach of our potential students?* Do they have, for example, an appropriate computer and DVD player to view and use the materials we are going to send? And the minimum training to use the computer? And the money to afford connection time? Or the time and money to travel to the videoconference room? And if thousands of students enrol, do we have servers that can bear thousands of simultaneous logins? Or will the "available" technology stop being really available the day courses begin because everything "breaks down" or "freezes"? Or will everything work properly but no one will be able to afford it?

If our answer to these three issues is 'yes', then we can say that the technology is available. This does not, however, guarantee that it is appropriate –or the most appropriate one– for the course or courses we have planned to run. Therefore, it will be useful to check a larger list, like the one suggested by Bates (1995, 2001) with the acronym *ACTIONS*, which introduces the following criteria to bear in mind:

- *Access*. It refers to what I have said before, though Bates places the emphasis on the student and on flexibility. How well does technology adapt to the different target groups?
- *Costs*. In part, I also mentioned this before and I will go back to it in the following chapter. Maintenance costs and particularly the cost of using them –whose main component is human work– tend to be higher than the initial cost of purchase. The main thing would be to compare the cost per student.
- *Teaching and learning*. Pedagogical problems are crucial. If some technology does not actually help in a concrete educational situation or if its contribution is similar to that of another kind of technology, we shall consider that other alternative.
- *Interactivity and user-friendliness.* How easy is this technology for students and teaches to use? What interaction possibilities between them does it offer?
- *Organisational issues.* What changes in the organisation of the institution and work are implied in adopting this technology to be able to use it successfully? What barriers do we need to remove? For example: who will be benefited from and who will not by its adoption? What extra efforts will it imply for everyone?
- *Novelty*. To what extent is this technology new? Is it reliable and stable? Has it been tested enough before having it massively spread? What previous student and teacher training does it require?
- *Speed*. How fast can courses be produced and run? How fast can materials be changed?

Faced with this group of criteria, all technologies will show both advantages and disadvantages, strong and weak points. A list should be made for each case and situation. That is, for each course and each type of student.

For example, we suggest you to try it with some specific case, giving a score according to the extent to which a certain technology that you wish to assess complies with each criteria.

	0	1	2	3
A				
C				
T				
I				
O				
N				
S				

0. Inaccurate, insufficient… 1. Satisfactory, fair...
2. Appropriate, good... 3. Very appropriate, very good...

Primarily, the technology that obtains the highest score for that case will be the best one. But a 0 in some of these criteria should worry us. How worthy is an almost excellent technology that is inaccessible? Or what is the use of having a technology that scores well in all categories but that is inappropriate from the pedagogical point of view?

As we will hardly ever find a technology that solves everything in the best way, in general we should *combine* more than one technology in order to solve the educational needs established.

Of course there are advantages in adopting *a certain* technology which more or less complies with all criteria. If the team or the institutions manage to master that technology they will be able to achieve satisfactory results for very different situations. It can be better then to make some efforts to guarantee that everyone –institution, students and teachers– can adapt to it.

Many think that IT-based and Internet-based technologies have enough flexibility to work well in any situation. As it is shown by our initial list, means and formats increasingly tend to be directed to telematics and they are able to bear and transfer sound, image, texts, animations and simulations. Others –I include myself here– think that this is true only to some extent, since the statement is too general.[3] Among other reasons because there is no *single* telematic technology but many other options. The fact that they all use computers and the Internet does not mean they are the same thing.

In the technological *mix*, we should not forget some "technology": the traditional face-to-face educational work. Interpersonal dialogue is still some "tech-

3 Cfr. Aparici, 2004; Fernández Díez, 2001; Huergo, 2000; Kaplún, 2000, 2001a and b; Lacerda, 2005.

nology" that is not easy to surpass in many senses. It can even fill a larger portion of the total duration of courses compared to other technologies.[4] Face-to-face sessions and group work, with or without a teacher, are very powerful teaching tools. Sometimes students are the ones who remind us of that:

> "(During a) a distance learning (experience) which was strongly based on the use of the Internet, teachers noticed the highly positive impact caused by two facts that had not been originally planned in methodological design. The first one: that students preferred to go to the computer room at the same time, thus several exchanges took place among them, instead of having them coming at the time of their choice, as it was first thought. In fact, they were trying to recover the sense of group which the course design had left out. The second fact that caught our attention was that they asked for a new "technological" support inside the room: a table. From then on, around a table, the group ended up being a group as such. This may explain, in the same way or even more, the "new" technologies used, the academic success of this group, which obtained better academic results than classroom courses, where group interactions tend to be poorer... (Kaplún, 2001b)

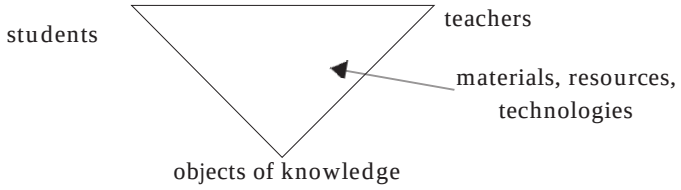
Texts, images and vocational training

I will not be able to assess each and every technology I mentioned according to this list of criteria. I would like to insist, though, on one aspect which I consider important for vocational training.

During educational processes, educators, learners and objects of knowledge meet. The educator aims at helping the learner to approach, discover, know and construct such object. In DL teaching materials, resources and technologies play a major role in this process of approach and construction.

In so-called e-learning, much of the material development is based on texts. The texts are published and digitally distributed, but they are texts anyway. Text is, no doubt, a very powerful language. It allows to deal with the most diverse topics by combining abstract concepts with a big deal of information. Their pro-

4 As it happens, for example, in SENAI-SC's postgraduate courses. Brazil has, in addition, legal regulations and quality indicators for DL which give significant important to this face-to-face component. (Cfr. SENAC, 2002; Tori, 2002).



duction may require great intellectual effort but not necessarily big production equipment or complex technology. A single person can produce an excellent text with paper and a pen. If they have a computer with a word processor, then much better. Training to write has been widely spread: there are many people who are capable of writing relatively well. This works like that according to the teacher angle of the triangle.

But if we have a look at the other two angles of the triangle, in the case of vocational training, there appear other aspects to bear in mind. On the one hand, there are several objects of knowledge that are linked to hand work processes and whose learning is difficult and sometimes impossible to achieve by reading a text. It is necessary to see them and experience them. A text can be very useful if it includes good illustrations. And if it is necessary to view some piece in movement and a delicate operation, then it is better to watch it on a video. And to experiment there is nothing better than a simulation…or a workshop.

To make a video or a simulation it is usually necessary to have pretty complex technological and human teams and more working hours than a text. Downloading a video from the Internet is very difficult to do without a broadband (even if you have it, it can take some time). It is possible that CDs or video cassettes have to be sent… or work should be done at a workshop.

On the other hand, vocational training students, particularly at basic levels, tend to find it hard to understand texts. They usually need to build a permanent bridge between abstract concepts and experience (cfr. De Moura Castro, 1984). For a text to achieve this –even for a video to achieve it– a careful pedagogical and communication work must be done (See Chapter 5). This turns material production into a more complex and expensive task.

On the other hand, it is not so certain that text production will be easy for teachers. Many excellent teachers, experts in their subject and in how to transmit it, find it difficult to share their knowledge through a text (cfr. Barato, 2004). Other experts are more willing to write, but the type of texts they produce are not so useful for students because they are too abstracts and theoretical.

All this adds specific pedagogical and production concerns to the difficulties in the access and in e-learning –at least text-based e-learning– in vocational training. This does not leave it aside in the least. But it forces to limit its relevance to certain objects of knowledge and certain kind of students. And, above all, combine it with other working methodologies and technologies.

How many and how good are the printed texts your institution uses in face-to-face teaching?
How are they assessed by students?

They can be good indicators to think about what is going to happen with your e-texts…

Technological models and educational delivery methods

Although the ideal technological mix should adapt to each particular case, it is advisable to visualise some of the typical models that have been developed historically and some of the most popular ones at present. In general, each model links some technologies with certain educational methodologies.

1. Self-study materials and tutorials.. They began as "correspondence courses" with printed materials. They may include other support materials, for example, to do manual work and exercises. Language courses include audio materials recorded on cassette or discs. Higher courses mainly have a selection of texts and study handbooks. Tutorials used to be done by mail or phone, and recently by e-mail. In many cases, there are also face-to-face tutorials, which may become something very similar to traditional classes, in a group with all the students of a course.[5] Assessment usually requires attendance.

Many current experiences still follow this model though materials may include videos, audio or multimedia CDs, apart from printed ones. The student receives them or picks them up from the educational centre –in a single package or several– and works with them. Sometimes work can be done in small groups.

5 It is the case, for example, of the Universidad Nacional de Educación a Distancia (UNED) of Spain, where students usually have tutorials every night which have a high attendance rate.

Tutors may be asked in person or else group work sessions are organised. In this case, sessions can be more than just "consultancy" and optional instances; they can be spaces for compulsory work that cannot be substituted by the materials. Some other times, exchange among participants is mainly done through the Internet.[6]

It could even be said that computer-programmed instruction is not that different. Material is already packed and the student works with it. The difference is that it offers the possibility of interacting with the material, according to various itineraries planned with more or less sophistication. From a tutorial to handle some IT software, to an "intelligent" course about a scientific topic, the essential model is the student who works alone with the material; then other interactions with peer students and teachers are added.

This type of model may be summarised in the following way:

1. Self-study materials plus tutorials.

Self-study materials (printed, audio, audiovisual, multimedia)
Individual work (and eventually group work)
Individual or group tutorials and / or
Face-to-face sessions and / or
Exchanges through the Internet (e-mails, forums, chats)
Assessment (usually face-to-face)

2-3. Radio schools and Television schools, educational radio and TV. First the radio and then television created great expectations regarding the potentialities of these means to educate large portions of populations who had difficulties to access educational centres. It was soon seen that they were not enough by themselves, it was necessary to add some readers and tutorials. Some experiences formed study groups. Many felt the need to go beyond the scheme of traditional "lessons" taught by radio or television in order to adapt better to the formats of both means, with documentary, journalistic and fiction resources. All of this rised costs and implied using mass media for very specific audiences. If programmes were not shown during prime time then they could not, in turn, adapt to the learners.

6 For example, the course on Distance Learning by SENAC (2002) or the one on Customer Service by INA (2004).

Many of these experiences were reconverted and became radio stations or educational programmes in a broad sense, but leaving behind radio or television courses. All or part of programming can have an educational sense, reaching a wide scope of social, scientific, cultural, environmental topics, among others, in very creative ways. This is something they have to do if they do not want to be doomed to the destination of educational programming, which is regarded as didactic but boring. They do not intend to make a methodical follow-up of curricula, assessments or accreditations. But there could be group work triggered by such programmes, phone dialogues with the audience, etc.[7]

Cable TV –and probably digital radio and TV in the future–,[8] which allows to divide audience even more, opens new experiences in terms of distance telecourses that are more similar to the original ones. In some cases tutorials and other support materials are reincorporated, by making use of the Internet, for example.

Another option which has been used by several educational institutions is to distribute some of their materials through the written press. They are usually self-study readers, that are relatively similar to the ones mentioned in the previous model.[9] Those who wish to have a course certification must pass a face-to-face assessment. Sometimes readers are compiled in books that may still be used after a mass dissemination period. Assessments here usually require attendance. Sometimes this is the only physical contact of the student with the educational institution.

7 The radio programme Sintonía SESC-SENAC, which is broadcast in all Brazil, has adopted some of these characteristics. It is complemented with readers to take better advantage of them (SENAC, 2004). And STV, the SESC-SENAC television network –"the channel of education and citizenship"– has a cultural and educational programming in a broad sense; it does not include distance learning courses, as such (see www.redestv.com.br). There are, however, private companies, such as Futura channel in Brazil and Formar in Argentina (which is exported to several Latin American countries) which include tele-resources that are supplemented with materials such as CDs or materials published on paper or on the Internet. We did not find this kind of experiences nowadays in the institutions we visited.

8 Depending on the technological model adopted or developed in each country, digital TV can also promote interactivity and Internet access, in a similar way to computers, with significant advantages in terms of costs and utility. Brazil is making an important bet on creating their own technological model, which will probably be shared with other Latin American countries, and thus be an interesting one (cfr. Barbosa and Castro, 2005).

9 This is how it was done, for example, by SENA in Colombia and SENAI-SC, with topics such as marketing, sales, etc.

We have then two main models:

2. Radio and telecourses, written press courses
Radio and telecourses (+ readers)
(or only readers distributed by the written press)
Individual work (and / or group work)
(Sometimes: tutorials by phone, in person or through the Internet)
Face-to-face assessments

3. Educational TV and radio
Educational programming in a broad sense.
Educational radio and telemagazines, educational soap operas, etc.
(There can be group work and dialogue with the audience)
(There are no assessments or certifications)

4-5. Tele and videoconference. At first they used to be conferences that were broadcast in a TV close circuit from the original place to one or several locations. Then there appeared various interaction possibilities between the audience and the place of origin, whether by phone, fax or television. In this last case, the scheme of "conference" can be broken and, although there is an operational centre that coordinates logins and logouts, an active interchange can be generated between several groups.

We can talk about two types of main models.[10] On the one hand, *teleconference*: usually massive events that reach a large number of conference rooms simultaneously and where the audience can ask some questions or express their opinions by phone, fax or the Internet, but interventions are centred on the conference lecturer or the central panel (cfr. SENAC, 2004d).

On the other hand, *videoconferences*, which often limit exchanges to only a few points (often not more than five or six) in order to guarantee an appropriate interaction among all of them. In this case, everybody can be seen and heard, several groups can be seen on screen or attention could be placed on one. There is a general view of all the groups or of one participant who intervenes, thanks to cameras placed in each connected location, with a voice tracking device. At least

10 Actually, the literature on this subject mentions these two methods in different ways and often interchangeably. I use here one of the terminology used to distinguish them.

up to now, the image is not entirely clear and there is some delay between issuance and reception which makes dialogue not entirely comfortable.

Similar systems are beginning to be spread through the Internet. They require a broadband connection and they have a limited amount of spots connected in order to assure good interaction.

In any case, when it comes to videoconferences, the degree of interaction depends a lot on the pedagogical design. It can be reduced to questions made by the students to the teacher or a more active exchange can be created. An element that promotes such exchanges is the presence of coordinators or tutors in each location and some group work done prior or after the connection.

Teleconferences seem to be used by vocational training institutions, whether for some big public events or internal training cycles (cfr. SENAC, 2004d). It is possible, though, to think of a complete course where *videoconferences* are the main technology used and they are combined with printed or Internet support materials, sending of work and comments via Internet and group work developed in each connected location, either in a large or in a small group.[11]

Tele or videoconferences may also be part of any of the other methods. For example, for a round table with some special guests or a regular exchange among groups. Internet videoconferences can also be an interaction method among the members of a single group. It can be very useful in corporate training programmes of enterprises or institutions whose offices are far away from each other.

At first, an advantage these technologies have is that they do not require extensive material preparation in advance: a lesson for a course can be prepared in a relatively similar way to a traditional lesson. But we should be careful about certain aspects in order for it to work properly and encourage genuine exchanges.

Assessment can be face-to-face, it can be done through work sent to the central team or handed in to local tutorials.

Leaving aside the possible use of other models, we could summarise these last two as follows:

4. Teleconference
Conferences broadcast to multiple rooms.
Questions and comments sent via fax, phone or the Internet.

11 We did not find this kind of experiences in the institutions we visited. Personally, I had to work with one at the University of the Republic (Uruguay). See www.relabor.fder.edu.uy .

5. Course with videoconference
Videoconference lessons, where students in different rooms interact through the same channel.
Printed or Internet support materials.
Local tutorial or coordination.
(Group work done before and / or after the connection)
Individual and group work.
(Student and teacher exchanges through e-mails or forums)

6-7. Internet at the centre: e-learning at last

Because of its flexibility, Internet adapts easily to several work methods, but we can also distinguish some predominant models so far. On the one hand, what we can call "pure" e-learning; on the other, there are multiple combinations that receive the name of blended learning since they are mixed or they combine several technologies and particularly distance work with face-to-face meetings.

In the first case, both materials and interactions among participants exclusively take place through the Internet. Individual or group work also require to be connected.

Work and interactions can be synchronous, asynchronous or more frequently, a combination of the two. Therefore, e-mail and forum systems are used (asynchronous) as well as chats and videoconferences (synchronous), mail, especially for posing queries to the teacher or exchanging information with another student or group of students, forums for general interaction, in the same way as chats and videoconferences, though these two can be used also for individual tutorials. There are several studies and opinions about the cases in which it is convenient to use synchronous or asynchronous tools. The general criterion is that asynchronous tools require more work but encourage more reflection and do not force us to combine timetables and vice versa.

Among the materials we can find are readings and activities. These can be exercises, self-assessment or external assessment questions, text composition, problem-solving activities, etc., depending on the content and the pedagogical approach of the course. They may include tasks to be done individually by students away from the computer: some research, manual practical work, etc.

We could include here self-taught courses without tutorials and only through computer interactions: tutorial programmes, texts with automated self-assess-

ment, etc. It could be said that the fact that a course is on the Internet does not make it different from the ones that are delivered on a CD and are installed in the PC, which we mentioned in model 1.

Together with "all online" methods, the use of the Internet is increasingly being combined with other means of material distribution, other student work methods and other forms of group interaction.

The first aspect, materials distribution, can make use of CDs, video cassettes, printed material, etc. as substitute or additional materials. This can avoid the problems of "downloading" heavy files and the transfer of printing costs to the user. Several contents can be dealt with during face-to-face sessions or through videoconferences.

Student work can also be focused on or supplemented by computer activities without Internet connection, that are then sent. There can be group work with students getting together physically or virtually. This is a particularly enriching delivery method that should not be excluded when working on projects. Although some exchanges among the members of a team can be made at a distance, it seems necessary that some contact takes place face-to-face. In several areas of vocational training, doing workshops is an essential component.

For exchanges with tutors, the telephone can be used together with personal consultations. For general group exchanges, face-to-face sessions are advisable. When a group works online but in the same place –a computer room– it is possible and desirable to have exchange spaces and collective work there (like in the example of the table above).

In general, distance learning systems have increasingly recovered face-to-face spaces. The advent of the Internet had made them look unnecessary after having a means with dialogue possibilities at a distance and among many speakers. However, everything shows that personal contact is very useful whenever possible.

Therefore, we can visualise two types of models:

6. Pure e-learning
Materials available on the Internet
Online individual work
Consultation to tutors by e-mail or chat
Group exchanges in forums, chats or Internet videoconference
Self-assessments and online assessments

7. Mixed Internet systems + other technologies
(Blended learning or e-learning+)[12]
Materials on the Internet and / or physical means (CDs, videos, print)
Distance individual or group work and face-to-face sessions (classroom, workshop, group projects)
Consultation to tutors by e-mail, chat, telephone or in person
Online or face-to-face group exchanges
Online and / or face-to-face assessments

This last model goes along the lines of what some call "no distance education" (Giusta and Franco, 2003).

It is highly possible to find delivery methods that can be combined with some of these (7). The presentation of these broad types helps to the effects of a combined evaluation of an *ACTIONS* sort, not only for one technology but for a technological model, a certain combination of technologies already tested on DL.

Models 3 and 4 are not applicable to vocational training in a strict sense, at least if we think about courses that can be assessed and certified. Model 6 does not seem very popular, at least in terms of basic vocational training: a minimum of work done in a classroom or workshop seem to be necessary. It is not yet clear either the more powerful return of radio and telecourses (model 2) which will probably depend on the development of digital radio and TV. In my opinion, the main technological options for distance vocational training in the short term are:

- Self-study materials with tutorials (and classroom, workshop and group work, etc.)
- Courses with videoconference (plus group work in each location).
- E-learning + classroom and workshop work, group projects, etc. (no distance education).

12 According to some authors, blended learning refers exclusively to the combination of e-learning and face-to-face lessons; others refer to blends between the use of the Internet and other technologies. I use 'e-learning +' here provisionally to refer to both things at the same time. Coming back to what I stated in Chapter 1, it could be said that a more accurate name, though too wordy, would be "distance and blended learning courses with the use of telematic and other ICT tools".

The second option does not appear to be reaching great development, may be due to the relatively high costs of the initial investment, the need to gather groups in particular places or times or greater promotion –cultural and commercial– of other technologies. However, I think it is a model worth taking into account, either alone or combined with some of the others. Several countries have public videoconference rooms that can be rented –at a reasonable cost for time spent and having a location connected–, so they may allow to start testing this model without making a private investment.

The first model is much more up-to-date than one would think, despite the advance of the so-called e-learning. Many institutions continue and will go on using it because it provides good solutions to concrete educational needs and situations. But everything shows that it will be increasingly combined with what we could call "e-learning +". Or, better said, the technological blend will include NICTs and other old ones which have proved their efficiency throughout time.

And what will certainly go on happening is the incorporation of NICTs to traditional face-to-face teaching, thus extending the access to materials and communication possibilities among actors in the educational system.

Finally, I would like to stress, once more, that one technology can be used with very different pedagogical approaches (See Chapter 3).

What are the most widely used models in your country nowadays? And in vocational training?
Have any previous models been left aside? Why?
What results have these changes brought?

NICTs for DL: assembling the puzzle[13]

A problem faced by institutions which embark on DL with NICTs –the so-called e-learning– is that they tend to add one tool after the other. They regard them as necessary but were not planned from the beginning. And later on they discover that it is hard to articulate them, that they are doing a work that is too artisan and annoying that could have been done better with a platform that integrates all of them. Or they chose a platform without being too familiar with its requirements and then they were faced with limitations or problems they had not expected.

Offering DL through NICTs implies carrying out a series of activities that are sometimes developed in a sequential way and sometimes in parallel. This set of activities can be grouped in three big areas:

- material development (design and production);
- course running (access to materials, activities for teachers and students);
- management (of courses, enrolments, certifications, materials, teachers).

Materials development and administrative management seem to be more frequent inside VTIs; whereas offering a DL course through electronic means appears to be a novelty and can create doubts and fears.

All these activities have technological requirements that institutions in general have never taken into account or are discovering at the time of beginning their DL experiences. To visualise them we are going to deal with three great areas of activities and identify and discuss the technological requirements and strategic decisions that will be faced by the institutions. On the other hand, each decision influences the others: choosing a technology for an activity affects the technological choices for the other activities.

Materials development

- IT tools

Authorware They are tools to develop teaching materials. The components of this group range from a word processor to animations development software.

13 The elaboration of this point was made by Eng. Rodrigo Filgueira, from Cinterfor / ILO, whose precious contributions I truly appreciate. I have just made some adjustments to his original text.

Teaching resources database.[14] In order not to "reinvent the wheel" it is worth having a system that describes and allows to reuse already existing educational materials. From animations about the water cycle to tutorials already validated for the use of simulators or "good" games of questions or exercises already used in the past.

Collaboration tools. Some development achieved by a multidisciplinary team, where it is also possible that some part is outsourced and it is advisable to use pre-existing resources, produces many files and versions of the same files. If we also think about teams that are not always integrated by the same kind of people and processes that can take many months, the situation is even worse. The solution is to incorporate new tools that allow a centralised management of the material produced and the software to manage versions. There are several options, whether owned, such as the open code, bought or free.

- Strategic decisions

The *tools used to develop materials* can be produced by different companies. There are two possible strategies to follow here. The first one, selecting the best tool each company offers for each function. For example, the software used for graphics can be bought from company A, the one to handle text from company B and the one for animations from company C. In this case we sacrifice the interoperability ability among applications: materials produced by one of them may not work well or be combined with those produced by another one. The second option is to "marry" a supplier, intending to achieve interoperability and sacrificing quality in some software or area.

Teaching resources databases can be made by adapting already existing applications with open source, acquiring knowledge management systems or making some development –our own or an outsourced one– that is adjusted to the institution's specific needs. This last option is highly recommended. The institution should at least carry out the exercise of analysis in order to understand what

14 See the already mentioned example of SENAI-SC (2004a). They are useful resources, both for DL and face-to-face classroom work. We do not refer here to "Learning Objects" databases, which are the basis of a methodology for the quick development of materials. It implies a significant institutional investment in people and technology that is not justified at the beginning of these processes. LCMS are very useful and also expensive tools to solve this problem. They are more than a database since they allow to develop materials and structure courses. Their use requires great planning and anticipating ability, as well as understanding and applying learning objects technology.

are or could be its requirements in this area. Descriptive elements that allow to correlate the material with the curriculum or the structure of courses can be very practical to avoid having a big database of resources that no one uses.

Regarding *collaboration tools*, teams should have to be trained in their use and overcome some of the cultural resistance since they demand more discipline and a little more "administrative" work.

To outsource or not to outsource. Variables that influence this decision are many and some of them have already been presented in other chapters. But it is worth insisting on the fact that any institution that aims at becoming more involved in this subject in the long term should have to learn on the way. Although outsourcing does not incorporate the "know how" in detail, it can be defined in such a way that this learning takes place effectively and dependence is not created with regards to the company hired.

Another interesting point is defining the copyright of the product developed in the most convenient way for the VTI. With respect to this issue, it is advisable to specify:

- Copyright of the material developed or –in the case of having software– the ownership of the code and the minimum accepted documentation levels.
- Selection of technology or technological line, not allowing companies to use tools only as a means to guarantee that they are essential. It is worth specifying aspects such as the following: use of tools that the VTI knows, tools with many years in the market (so that it is not difficult to find human resources), tools with a large community of users, if possible.
- High levels of interaction between the company and the managers and technicians of the VTI. This allows to make regular assessments of the development, to suggest changes and new paths, to follow the process closely and to learn about the difficulties that can be encountered.
- Specify guarantee period. Technological solutions tend to have mistakes that need to be corrected. It is worth establishing both the VTI's support and tolerance when faced with frequent errors and failures.

Type of material to be developed, from printed material to simulations or virtual reality. If the technological decision is dependent on the pedagogical objective, we cannot establish a close relationship between a material's complexity

and the type of course. Primarily, materials for DL course that seek to develop mainstream competencies require less effort and investment than distance courses on automobile mechanics or CNC turning. It is clear though that if we decide to develop a role simulator for a course on ethics or sales, the cost and effort can be too much.

Standard-based development: SCORM? If a course is developed according to a SCORM standard,[15] it can be transferred to any LMS platform that is compatible with SCORM. This offers independence from the LMS and LCMS supplier (a topic we will soon deal with). But to embark on SCORM-based courses, it is necessary to make efforts and investments that can be excessive if we are taking the first steps in this activity.

Running a course

- IT and telecommunication tools

  Software

  - *E-mail* for person-to-person communication or mailing list discussion.
  - *Chat systems*: online synchronous communication. General content is not kept.
  - *Forum systems:* online asynchronous communication. It offers more meditated interaction than the chat. The content usually remains available to the rest of the participants.
  - Videoconference systems through telephone lines or the Internet: real time face-to-face communication.
  - *Teaching resources database.* The selected materials for the course and some similar ones must be available to adjust the course to the tutor's or the student's needs.
  - *Collaboration tools* to carry out work with groups of students.
  - *Tools to follow-up* students (access to materials, academic performance, etc.) and the monitoring of tutors by coordinators.

15 Sharable Content Object Reference Model.

Hardware

- *Telecommunication servers and equipment.* This equipment is usually available inside the organisation for pilot experiences or those having a small number of students; no investment is usually needed. But if the intention is to cater for large populations, then it will be necessary to establish services to fulfill these functions: servers with software to balance load and broadband reserve for course-related traffic. This will also be necessary if the idea is to have a lot of videoconferences through the Internet.
- *ISDN videoconference equipment.*[16] If the videoconference is not done through the Internet, the ISDN lines need to be installed at local and regional units as well as ISDN videoconferencing equipment.

• Strategic decisions

Computing and telecommunications centre. Computing and telecommunication departments should be involved from the start. In this way, they will be able to assess which amount of work is expected and if it will be possible to handle it with the available resources. It does not seem advisable to have a parallel computing centre since the 'know how to accumulate', by launching this activity, should be taken advantage of also from the computing centre.

LMS or the sum of services. It is often the case that the technological tools required to offer DL with NICTs are already available in the VTI, as a sum of independent tools that are disconnected at the IT level. This situation will have to change in the medium-term, by incorporating a LMS or a LCMS since maintaining a sum of isolated services demands too much "manual" work and confusion to participants and makes the process more prone to mistakes. We will come back to this issue later on.

Outsourcing. The option of hiring connection services, software and servers is tempting since it takes pressure away from already existing computing centres and it allows to place responsibility on a supplier who can be required to comply. This is even harder when the means is internal, and if the service is new and had never been considered within the plans of the computing centre itself

16 "Integrated Services Digital Network" that allow to transmit data, audio and static and moving images through a single means.

(we can be faced with answers such as "we are doing our best"). But hiring external services increases in price as the enrolment of participants grows. So if it gets too expensive, the VTI will have to consider offering these services with their own staff.

Buying LMS systems or developing our own. Buying large-scale LMS can be expensive and only seems to be justified once a DL programme with NICTs has been consolidated as an institutional decision and/or when the intention is to achieve a high number of enrolments. Having our own development or outsourced one according to our needs seems to be interesting but it requires having a permanent staff of people making improvements and maintenance or keeping a strong dependence relationship with the developing company. A third alternative, which is less expensive and provides strong back-up, is adapting already *tested open source tools*. We will come back to this topic later on.

Educational management

- IT tools

  Management systems that are similar to the ones available at VTIs but which have extra functions:

  - Allowing online enrolment and, perhaps online payment.
  - Managing marks and assessment of students online.
  - Online supervision of geographically distributed tutors.
  - Materials and group management. Cases where the material is distributed in batches –which do not always have the same size– to different centres or students' addresses should be planned.
  - This system must be interoperative with the usual administrative system and the LMS that is currently being used. It will be necessarily developed by the VTI since the administrative needs of each of them are not interchangeable.

A telecommunication network that integrates local and regional units with central units. Local management systems must be able to interoperate in some way with central management systems.

- Strategic decisions

Integrating these new characteristics to pre-existing systems. There are two options: developing a system that is independent from "passed on" systems or opening up the possibilities of existing systems. The first option is easier to develop since it does not require considering any existing technological restriction, but it should simultaneously develop some communication mechanism between the passed on system and the new one. As a result, this connection will not take place in real time and data will be strongly marked by "manual" activity, which makes it more prone to the appearance of mistakes. The second option provides a system that is more integrated but which tends to be more complicated since passed on administration systems were in general developed time ago and with no Web-oriented technology. They are solid systems that are not frequently modified and it is possible that the people who developed them are no longer available. In addition, in the same way as in football, "if the team is winning, then we do not change the players". Another justified resistance can come from the fact that some of the characteristics that wish to be added do not correspond to the original function of the existing management systems. In general, we will find the way to apply the first option and develop clear interfaces and accurate processes to connect both systems.

Interoperability between the educational administration and the LMS. In the case of buying an LMS it is advisable that the data required by our management system can be extracted from the LMS. If we develop our own LMS or an outsourced one, we will not have major problems to integrate data sources as we are the ones to establish requirements. In the case of being adapting an open source LMS, it will be simple to incorporate a module to communicate the LMS with our management application.

Which were the strategic decisions your institution made in terms of technology to develop materials, run courses and manage education? How do you evaluate them? Could better decisions have been taken?

Educational platforms

It is worth considering more in detail this tool or group of integrated tools called LMS and LCMS. If an institution has taken the firm decision to embark on e-learning, it is likely that sooner or later it will end up choosing or creating a platform of an LMS or LCMS sort.

Creating our own can be extremely expensive and is only justified if we have available human resources to handle it and if it is taken as a research and development area.[17] The time taken for testing and correcting failures or problems until the platform is mature enough can make this path even more dangerous. Ordering one can be a good alternative to ensure it meets exactly our requirements, but it can also be an immature product and can leave us tied up to the supplier if the necessary provisions are not made, like assuring training and the subsequent ownership of the software's source.

It may be interesting in the future to think about some collective work in this area among VTIs in order to obtain a product that adapts better to their needs. The potential customers and the community of users that the platform will have may be the justification.

But, in the meantime, in order to choose a platform, it will be necessary to compare some of the available ones, according to the specific requirements of the institution, the type of course and the pedagogical approach and characteristics offered by each of them.[18]

In general, different platforms offer:

- Content management, edition and file management.
- Students register. Users database.
- Different access levels for managers, teachers and students.
- E-mail, forums and chats management. Some offer videoconference management.
- Notices, organiser for pending tasks.

17 It is the case of the Centro de Tecnologia em Automação e Informática of SENAI-SC in Florianopolis, which we visited for the purpose of this work. The experience can be followed by other VTIs.

18 I use here some of the ideas suggested by Eduardo Fernández and other members of the Computing Institute of the Engineering School of the University of the Republic (Uruguay), who have been working on this subject for a long time and have shared it with the University's IT and Educational Network. Cfr also Fontela (2003).

- Management of assessments and self-assessments (closed, open, of automated and manual correction, compulsory or optional, repeatable or not, etc.).
- Access statistics (logins and connection times).

Some also offer:

- Tools for group work (collaboration software, group portfolios, etc.). This is particularly important if group work is part of the pedagogical approach.
- Content downloading to work offline. This is helpful when connection costs are too high for students. In general, in this case the access time statistics are lost.
- Possibility to customise each course according to the needs of each user. This allows, at least in part, to avoid the rigidity teachers and students usually complain about.
- Use of international standards (such as *SCORM*), which allow to transfer everything or part of a course to other platforms. This can be useful to share experiences and work with others and when there are already existing platforms.

Other three aspects to bear in mind:

- Owned or free software. The first option may offer more back-up and maintenance guarantees, the second one, saves money and gives access to the source to modify and adapt characteristics of the software.
- Community of users. The larger this community and the more active it is, the more chances there will be of solving problems and improving the product.
- Scalability. It is the possibility of expanding the number of users without the risk of "breakdown". This is particularly important if we are going to have thousands of students. It can be rather annoying to find out late that hundreds of thousands US dollars will have to be spent on additional servers that can bear such number of users.

If you already have a platform, which criteria did you follow to choose it? Which are its strong points and the problems you encountered?

Chapter 10
Costs: the (uncertain) break-even point

How much does a distance learning course cost?
More or less than a classroom-based course?
And how much does it cost preparing it with NICTs?
More or less than preparing it with other technologies?

The answers to these questions depend on so many variables that in the end there is not a unique answer. This chapter intends to help you making an estimation of the costs of a course or programme bearing in mind important issues that are usually forgotten and its subsequent problems: things that can not be done because money was not set aside for that purpose, quality affected by such lack of foresight, costs that are higher than it was expected… directors, teachers and students angry at "those who had the great idea of involving us in this..."

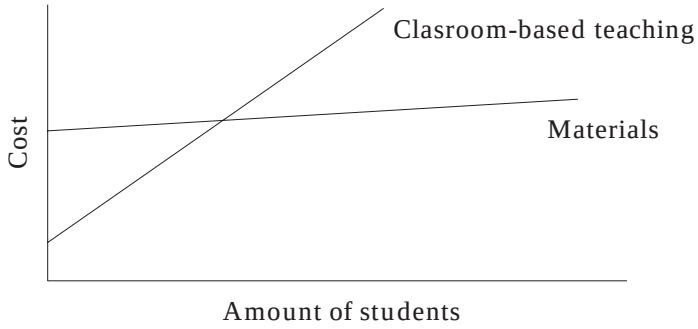
But I have already said this at the beginning, working at a distance or working with NICTs is usually not cheaper. It can even be more expensive, at least at the beginning. But this can be seen as contradictory to the general opinion that has led to several mistakes. Here you will see why.

Fixed and variable costs: economies of scale

As in many other human activities, it is possible to recognise fixed and variable costs. Distance learning courses have *fixed costs* that can be reduced with respect to face-to face courses such as those derived from premises and furniture… except when classrooms with computers are offered to students, in which case costs can be higher.

There are additional significant fixed costs regarding classroom-based courses in the area of production of materials. That is a fixed cost for any course because it does not depend on the amount of students. The cost of the materials will differ depending on whether they are textbooks, videos, multimedia, etc. I will come back to this issue later on. In all cases, as I have already said, preparing the materials for a distance learning lesson takes much more time than that usually devoted by a teacher when preparing a classroom-based lesson. The difference is that the material can be used by a greater amount of students. Furthermore, it can be used more than once and during several years (although it will probably have to be updated and adjusted). The *economies of scale* could therefore compensate for that higher fixed cost.

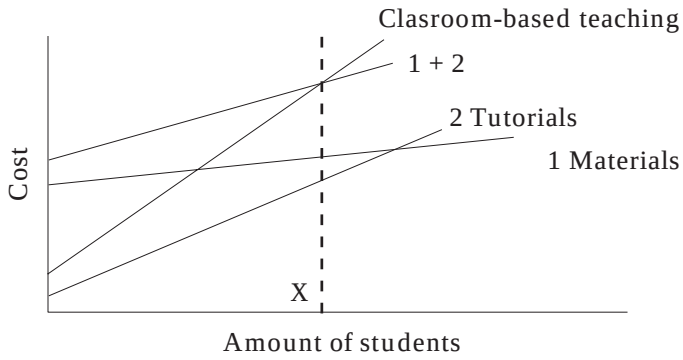
As Bates suggests (2002:162),[1] one could think the situation is as follows:



However, this situation does not consider tutorials. There are few cases in good DL in which the materials are useful on their own, without interaction between teachers and students. The cost of tutorials is *variable* because it depends on the amount of students. In general, a distance tutor teacher can satisfactorily handle the same amount of students a classroom teacher can: between 25 and 50 students depending on the type of course. Nevertheless, some people believe less or more students can be tutored (10 per tutor or up to 100 students per tutor) (cfr. Rumble, 2001; Bates, 2001). Some say the time devoted to a group is shorter than that in the classroom because students spend more time working on their own with the material and the tutor only clears up doubts. Others state tutorials may be more time demanding because the amount of queries is usually higher and they are

1 This cost-student graph and the following one follow what Bates considers (2001:160-165), although not literally, adapting some of his suggestions to this book.

usually more difficult to answer (Rumble, 2001:81-82). Let us suppose that, finally, the cost of teaching is a little lower. Then the situation would be:



What is the amount (x) of students in which a distance course with NICTs is cheaper than a classroom-based course? As Bates states (2001:164): "no one knows for sure". But he does mention a figure for a given case: 100 students per year during four years (400 students in total). That amount may be significantly reduced if less sophisticated materials are used.

As it can be seen, the key to the possible economies is in the scale and the "life span" of the course (which also affects the scale). However, it is neither always possible nor convenient to increase the scale for the *same* course. Increasing the scale means increasing the amount of students and / or repeating the same course many times. That may lead to an outdated course or to a course that does not adequately adapt to the different groups. Updates and adaptations increase costs. As I have already mentioned, the supposition that tutorials demand less time than classroom-based teaching is a widely challenged idea.

It is worth analysing the fixed cost of the production of materials. Said cost shall significantly vary depending on the material produced. As an example, see the chart of average costs above for a three-unit course (expressed in US dollars):[2]

2 Values taken from *Arizona Learning Systems* (1998) quoted by Rumble (2001: 80). Each unit is equivalent to about ten hours of the course.

Design of the course and activities	6,000
Textbook	12,000
Textbook with reference material	18,000
Textbook with reference material and pictures	37,500
Audio and video	120,000
Simulation	250,000
Virtual reality	1,000,000

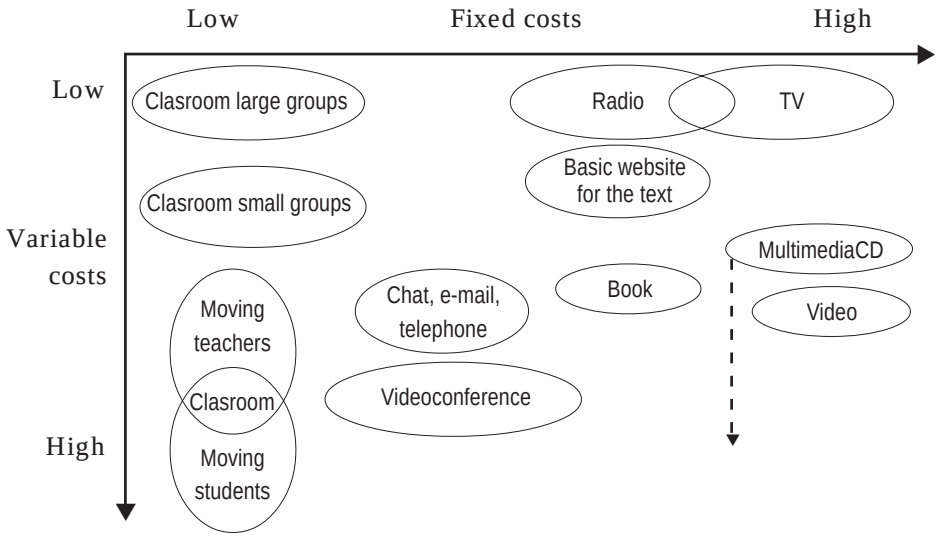
Please notice that, as an example, between producing a textbook with reference material and pictures (typical in many Web sites) and a video, costs increase by more than three times. These costs may be lower in absolute terms in developing countries but the proportion is probably the same.

It is worth mentioning that when a book is used as the basis, depending on the kind of activities proposed and the use of graphs and pictures, the usual estimation is that each hour of study (equivalent to one classroom hour) requires preparing between 3 and 5 pages. That is to say a 30-hour course requires between 90 and 150 pages. Besides, this does not include reading the reference bibliography. (cfr. Auñón, 2000).

The structure of fixed and variable costs is different for every technology. Producing a television programme has high fixed costs but once on air there is no difference whether it is seen by one thousand people or by one hundred thousand people. In all cases, the cost will increase if another hundred thousand people sees it in another city broadcasted by another channel, but the increase will be small. That is why the production of television programmes requires very big audiences to justify the costs.

It is important pointing out that in all the cases, the bigger fixed costs do not mainly correspond to the technological *infrastructure* but to the *work*. Longer periods of time are necessary and, above all, larger groups of people.

We can also make the estimate more precise for face-to-face teaching. As an example, if the problem is addressing those who are far away, we could ask ourselves if it is convenient to take the teachers to the place or bring the students to us instead of implementing solutions at a distance. Then, charts such as this one can be built (Fernández, 2001):



This chart compares isolated technologies but not integral technological models, as I suggested in the previous chapter. The only integral "technological" models (technologies and working method) that appear here are those corresponding to classroom-based teaching. If we take technological models, many variable costs may increase mainly due to tutorials. For instance, a course that uses mainly multimedia CDs, will move downwards, as the dotted line indicates, if the variable costs due to tutorials increase.

Do you think the videoconference is correctly placed in the chart?

There exists some consensus on the fact that models that entail predominantly *asynchronous* work are more expensive than those that mainly entail *synchronous* work (Rumble, 2001:80). As an example, "e-learning +" or "no distance learning" would be more expensive than the courses based on videoconference because the fixed costs are higher.

Some hope arouse over the fact that new technologies would make distance courses cheaper with respect to the old technologies; for example, distance courses based on printed texts or the Internet. Apparently this has not been confirmed. On the contrary, if costs *per student* are compared (which is finally the important

estimate and the one that summarises all estimates), there appear results such as the ones that follow: in the case of a 30-hour course for 200 students the cost is around 100 US dollars per student with the printed version and 150 US dollars with the online version (Inglis, 1999 apud. Rumble, 2001:85) although the difference between both of them was lower in smaller scales, where the printed version has relatively higher fixed costs.

As an example, the case of a 30-hour "e-learning +"course is presented here with texts and illustrations, tutorials, working in small groups and two real meetings with the tutor. Variations are estimated every 50 students mainly because it implies adding a tutor and physical space for meetings. The places where the small groups meet, as well as the computing equipment and the connection is paid by the students or through agreements with institutions which do not charge for the service. Then, the costs in the chart (expressed in US dollars), are only those that affect the budget of the institution.[3]

Students	50	100	150	200	250	300	350	400	450	500
Fixed costs	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Variable costs	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000
Total	16,000	17,000	18,000	19,000	20,000	21,000	22,000	23,000	24,000	25,000
Cost per student	320	170	120	95	80	70	63	57	53	50

Costs of programmes, transfer of costs and opportunity costs

It is also possible to speak of fixed and variable costs in the case of a programme that prepares a set of courses. Fixed costs refer to infrastructure and human resources. As an example, the infrastructure for computing or videoconference can be used in a better way if it is shared by many courses and not by few courses. If they were very few, it may even be better to consider hiring all or part of the infrastructure instead of buying it. Furthermore it is important to bear in mind that with respect to NICTs, the equipment requires important maintenance and has a short life span which is estimated in three to five years (Rumble, 2001:91). This leads the fixed costs of a programme to increase largely.

3 The example takes, schematically, the data of a course in which I worked (cfr. Motz, 2001).

There are also variable costs regarding equipment. For example, one course can work with a small server but more equipment will be necessary in the case of many courses. More equipment and offices may also be necessary for the people producing materials.

Regarding human resources, there are also directing teams and technicians of various areas (camerapersons, graphic designers, computer specialists, etc.) that can work more profitably in a programme with various courses than in one with few courses. Again service contracts or outsourcing may be convenient to perform some of these tasks for few courses. In sum, there are also economies of scale in this case. The cost of adding courses to a programme is increasingly lower. That is why these programmes may be more expensive at the beginning, while they are being tested and people are learning about them and few courses are launched.

It is also true that huge programmes may turn into a difficult thing to manage and may give rise to hidden costs due to inefficiencies. The scale, up to a certain extent, may turn to be a flaw, and not a virtue. That explains why sometimes very big programmes prefer important levels of decentralisation.[4]

Some costs exert a direct influence on the institution and others do not because they are transferred to teachers or students (or to other institutions). But they should still be considered. For example, rooms and equipment for tutors and students can be set up, or these costs can be avoided if they work with their own equipment from their houses (or from cybercafes…). In this case these costs will not affect our budget but it will have an impact on the estimate students make in order to register or not for the course or on the one made by the tutor when deciding to accept the job or not. Therefore, tutors working under this methodology are usually rewarded in some way if they use their own equipment (the same as the delivery boy that uses his own motorbike). That leads to the fact that if one wants to include low-income students, it may be necessary to pay for hours at cybercafes or to enter into agreements with public communication centres or other institutions.[5] In such case, although costs may be lower, they will affect the budget once again...

4 For example, the virtual courses of SENA (Colombia) are produced by regional teams depending on the resources and the experiences each team has although later the courses are offered throughout the country.

5 It is one of the strategies quite intensely developed by SENA in Colombia.

Students will also estimate their *opportunity cost*. Perhaps if it were a classroom-based course students could simply not take it because it would imply travelling long distances, leaving their families or resigning to some hours of work. Those items will affect the estimate. And it is in this scenario where DL or blended learning methods win –or lose– many battles: in showing its advantages in terms of opportunity cost.

Do you remember any battles lost or won by distance learning courses? Do you remember having decided between one possibility and the other? How much did the opportunity cost weigh?

Production of materials

As we can see, in order to be able to afford a course or programme, many elements should be taken into consideration. A way to order them is to separate them in three big areas: production of materials, course running, and management and infrastructure costs. Below you will find a list of elements that should be considered for producing Internet-based courses.[6]

Regarding the **production of materials** the following items should be taken into account:

- *Kind of material*. If the materials are only texts, the costs will be much lower than if pictures, videos or simulations are also used. The kind of topics to be presented may also exert an influence on a greater of lower degree of complexity.
- *Amount of users (and life span of the course)*. The higher these items are, the smaller the costs per year and per student will be. Some materials will only be used in one course and others will be useful for many (for example, the introduction to the use of the computer and the platform). If physical materials are produced as well as "virtual" materials, the costs of preparing copies and packaging should be considered. Generally those are proportionally lower when the amount increases.
- *Possibility of using already existing materials*, owned or not by the institution. In this last case, if students have to buy them, they will not mean a cost to the

6 Here I mainly follow Rumble's suggestions (2001). See also Bates (2001).

institution but they will result in an increase of the students' cost. It may also be necessary to pay for the use of someone else's materials.

- *Production, tests and reviews*. The three items above should be taken into consideration. Apart from the production itself, it may be necessary to pay for testers, assessments and adjustments as well as for revisions of the subsequent versions of a course (which are usually done once a year; such is the case of changes in assessments).
- *Qualified staff*. Verify if there is in-house qualified staff for producing the materials or if it will be necessary to hire people from outside the institution or spend money in training. Costs may increase because the internal staff may have to be exempted from performing other tasks or receive extra payment for the production of the materials. The external staff may be cheaper or more expensive than the internal staff depending on how specialised its work is and the market conditions.
- *Equipment and expenses*. This issue analyses whether the institution will provide the computing equipment or if it will belong to those working in the production, in which case the institution will make up for said contribution in some way. The same will happen regarding supplies, expenses arising from the Internet connection, etc. If the equipment is provided its recouping time should be estimated (3 to 5 years).

Running the course

- *Advertising and marketing*. These may be part of a general policy for all the courses of the institution (see the next item) or require special financing due to the characteristics of the course: massive audience, problems in attracting people to the course, etc. The costs of this item may range between 10 and 20 per cent of the total costs.
- *Administrative costs*. For enrolments, services of the students' administrative office, collections, etc. It can usually be estimated in around 10 per cent of the total cost of the course.
- *Distribution of materials*. Traditional mail (for example for CDs) or e-mail, servers for the materials in the Internet, etc. The costs for those receiving the material must also be taken into account. It will have to be decided if it will

be paid by the institution in some way or by the students (in this case it does not affect the institution's budget but the cost for students).

- *Tutorials*. Payment of tutors by the hour, with a fixed salary, etc. The amount of students a tutor can manage and how much time each student demands is under discussion. An average range is possibly between 30 and 50 students per tutor working from 8 to 10 hours a week for a course of 2 or 3 hours a week. There is also a discussion on whether it is convenient or not to resort to cheaper teachers (younger people, advanced students, etc.). Other possible positions such as monitors or tutorial coordinators must be taken into consideration.
- *Equipment and connection expenses for tutors and students*. Computer rooms, software, printers, etc. Maintenance and recouping of the equipment (3-5 years) must be estimated. In case the equipment belongs to tutors or students, it is important to decide whether they will be compensated for it. Expenses due to the Internet connection and telephone should also be considered. Toll free lines for students may be made available with a resulting cost for the institution. *Classrooms* or meeting rooms must be accounted for, if necessary. They can be shared by many courses; its cost could be distributed (see infrastructure and management).
- *Opportunity cost*. It does not affect the budget of the institution but that of the student. Students can continue to work while they study, save money on transportation and time, etc. Students can estimate how much they would lose if they took the course with a face-to-face methodology. (But be careful: working at a distance does also take time and demands a discipline that is not always easy to keep. A high dropout level is one of the problems DL has been traditionally fighting with).

Management and infrastructure

- *Programme management*. The team may be large or small depending on the importance of the programme for the institution. It involves salaries and expenses (communications, trips, etc.).
- *Training*. The production of materials, tutorials and the management of the programme itself usually require important initial training. Periodical up-

dates and continuing training are necessary as well. Remember new staff. Initially a high cost can be estimated for it to be recouped in 5 years. Then an estimate for an annual fixed cost for this item can be estimated as well. It can be done through in-house staff, external hired personnel or combining both.

- *Assessment and quality*. Staff and expenses for the quality control, external assessments, consultancies, etc.
- *Web sites*. Development and maintenance costs. It can be developed internally or outsourced. The initial cost must be estimated on an annual basis, for example, considering its life span is 5 years. It involves work and equipment which must be recouped (servers usually last 5 to 6 years). Although the site may be shared by the entire institution, these programmes usually change sites a lot and part of the costs should be undertaken by them.
- *Platform (LMS or LCMS)*. Initial licence cost and payments for updates. Both may be free but they will probably have to be adapted, installed and maintained. They also need servers.
- *Office, furniture and fittings, and equipment*. Premises are usually recouped in 50 years; furniture and fittings and the equipment in general in 5 to 10 years. Another possibility is considering the cost of renting. Taxes, insurance and maintenance expenses should also be taken into account. In case only a part of the existing premises is used, the corresponding proportion should be considered as well as the expenses derived from stationery and supplies. The same estimates of costs used per job position can be used for other programmes (although these job positions may be more expensive due to the equipment).
- *The Intranet*. The Intranet may be an already existing part of the infrastructure of the institution and will be estimated on a pro rata basis or may have to be installed for this programme which will undoubtedly need it. Its recouping is estimated to take 5 to 6 years.
- *Classrooms*. The proportion of attendance time to courses should be estimated as well as the corresponding spatial needs. A usual problem is that, in the case of working students, classroom needs are usually clustered at night. It may be necessary to rent rooms. Agreements can be made with enterprises, especially with regard to corporate training.
- *Documents and information*. Library, subscriptions to publications, information and documentation services, etc.

- *Advertising and marketing*. A general plan for this area usually reduces the costs if compared to advertising a single course.
- *Administrative costs*. Everything that was said regarding course running applies here.

These management costs explain, to a great extent, why very small programmes with few courses can be fairly more expensive than large ones. It is because these costs are not absolutely proportional: there is a minimum management cost that is necessary and after a certain amount of courses, the increase due to the addition of a course is very low. This also explains why outsourcing a part of the tasks may be convenient in small programmes.

For the case of programmes the higher cost is also derived from human work. Although the initial investments on equipment may frighten you, the higher expenses will always lie on paying those who produce materials, teacher tutors, programme directors, support technicians, etc. On the other hand, IT investments have a barely short life span and high maintenance costs. If these two facts are not taken into consideration, an investment on equipment for DL with NICTs may become, in a while, a technological cemetery of equipment that can not be used or nobody wants to use.

The list of the following page summarises the aspects to be taken into account. They have been classified in general factors, staff, investments and expenses. Repeating items that will have to be included in each course or in the programme in general, or that will not appear in the budget of the institution but may have an impact on students or on other institutions, will be found between brackets.

Did you find any aspect that was not taken into account while analysing the budget of a course or programme with this list?
What consequences did that have?
Were there other aspects that did not appear in the list?

	General	Staff	Investments	Expenses
Production of materials	x			
1. Kind of material	x			
2. Amount of users	x			
3. Use of existing materials	x			(x)
4. Production, tests, and reviews		x		
5. Qualified staff		x		(x)
6. Equipment and expenses			x	x
Running the course				
(Advertising and marketing)		(x)		(x)
(Administrative costs)		(x)		x
7. Distribution of materials				x
8. Tutorials		x		
9. Equipment, connection (and classrooms)			x	x
(Opportunity cost)	x			
Management and infrastructure				
10. Programme management		x		
11.Training		x		(x)
12. Assessment and quality		x		
13. Web sites		x	x	x
14. Platform (LCMS)		x	x	x
15. Offices, furniture and fittings, and equipment		x	x	x
16. The Intranet		x	x	x
17. Classrooms			x	
18. Documents and information		x	x	x
19. Advertising and marketing		x		x
20. Administrative costs		x		x

Chapter 11

Launching and sustaining a DL programme with NICTs Speed, risks, and opportunities

The initial decision of starting a DL programme with NICTs depends on the issues mentioned in Chapter 2. Just as a quick reminder:

In the first place:

- The distance that separates the students and the educational institution and their geographical scattering.
- The time available by the students. Or their resistance to attend an educational institution.
- The need or interest in broadening the scope of the institution, caring for (or caring for in a better way) those students from far away areas, geographically scattered, with little time available, or limited possibilities of attending an educational institution.

Other possible benefits may be:

- The opportunity a programme with these characteristics offers regarding a pedagogical (as well as technological) update.
- The interest in bridging the "digital gap".

All those may be good reasons but must be carefully assessed. DL with NICTs is not always suitable and it can even produce contrary effects as I mentioned in Chapter 2.

There can also arise:

- The need and interest of cost saving.

This is generally false, as I have already said. However, in some cases the savings are important when distances and scattering are significant. Some savings may be the result of transferring some costs to the students or to other institutions, as I mentioned in the previous chapter.

There can also be:

- "Market" requirements and opportunities: an increasing demand of new educational delivery methods.
- Institutional requirements and opportunities to start this kind of programmes "in order to be up to date", "to modernise", etc. A clear example of this is when there are funds available for these programmes (from the institution, its financing institutions, the government, international organizations) but not for other things.

When these factors are present, it is crucial to study how to benefit the most from opportunities and avoid the risks they might imply. For instance, opportunities regarding pedagogical updates, reaching new sectors, increasing income due to corporate education and due to postgraduate courses. And risks such as confusing technological with pedagogical updates or not considering the most disfavoured social sectors.

In case there is a programme in your institution, what reasons led to its start? In case there is not, why are you thinking of starting it?

Where do we start?

A DL programme with NICTs is not easy to prepare for the inexperienced ones.

That is why as a starting point, it would be convenient to prioritise some courses, topics or areas and some type of learners. As I mentioned in Chapter 2, within vocational training there usually appear:

- *Complementary* training in subjects and *mainstream* competencies.
- *Levelling* basic training.
- *Updates* for people who already have an important prior training.
- *Postgraduate courses* for working students.
- *Internal training*, particularly for teachers.
- *"Corporate"*, "tailor-made" courses for enterprises.

Working in all or just some of these areas will depend on the strategic decisions of the institution. Probably the social and political priorities of the institution will be important: the people who will benefit from them, the impact on their job opportunities, etc.

The previous experience and the existing abilities may also be significant. For instance, it may be convenient to start with courses with which the institution has had previous classroom-based teaching experiences. Another possibility would be to start with courses with which the institution has had previous experiences working at a distance but with "older" technologies.

What is old and what is new?

What may be better for launching a DL programme with NICTs? Young people or experienced people?

This kind of programme is a good chance for pedagogical and methodological updating. It forces training and research as well as experimenting and assessing. It demands making educational processes explicit, which may be useful afterwards in other areas of the institution. It gives good reasons to incorporate new people to it…or experienced people… Or, to combine experiences and share knowledge.

Many vocational training institutions have experience in DL. However, they do not always take that into account when engaging in e-learning. And that is a shame; in fact many of the problems they will encounter are those that DL programmes have already found. Much of the knowledge gained from those DL programmes will have to be rebuilt at higher costs, if that experience is disregarded. The so called e-learning ***is*** basically DL that uses NICTs.

What I mean is, for example, problems and knowledge regarding issues such as:

- Cases in which DL is adequate and cases in which it is not.
- The building of multi or interdisciplinary teams.
- The pedagogical design of the courses.
- The production of materials.
- The work of tutors; selecting and training them.
- Assessment of technologies.
- Financing courses and programmes.
- Management of distance or blended learning programmes.

For example high dropout levels have always been a problem and concern of DL that reappears or simply continues. Alarming dropout levels of up to 80%

have existed and continue to exist. In view of that, things which took time to be learnt, such as the importance of tutorials and motivation, the reestablishment of the face-to-face meetings and the groups, must be appreciated.

Regarding all these issues, those who have worked in DL have an invaluable experience. If that experience has been systematised and assessed,[1] the whole team should know about it. In case it has not, ways of sharing must be found. Integrating people who have participated is crucial.

As I think it has been made clear throughout this book, that experience will not be just a past experience to bear in mind but something to be directly incorporated in many cases. Many combined delivery methods ("blended", "no distance", etc.) include things from the "old" DL that, in many cases, are still very useful. Printed material, audio recordings, videos or face-to-face activities will be part of many good "new" programmes. It would be a pity to think that as "now everything is done through the Internet" we spent months or years before learning it.

In some institutions NICTs are simply another aspect that has been included in the departments, area or programmes of DL.[2] This appears to be a good option when those departments are strong. However, it is also true that some distance programmes may have weakened and they may no longer be adapted to re-launch DL.[3] They may have even become stagnant in pedagogical or managerial issues or may have failed in issues that internally invalidate them. But it is even possible to learn from the failures (and particularly from them)...

Speed of implementation

If a DL programme has been working for some time, making it grow or changing its technological aspects may not be so difficult. But if there is not such a programme or if it is very weak, how fast will it be convenient to move forwards?

Will it be better to start with a small team and pilot experiences? Or set up a big team from the beginning and plan having thousands of students in the first year?

1 See for example Restrepo, 2002.
2 Such is the case of SENAC in Brazil.
3 Apparently this was the case of SENA in Colombia.

It may seem obvious that the first option is the best. And that is what some institutions have done.[4] It may be too risky to fully engage into a great investment and face problems with little experience and without pilot tests to improve the course of action.

Pedagogical failures (high dropout levels, bad educational results), social failures (the expected learners do not take the course), economic failures (wrongly evaluated costs), or technological failures ("broken down" courses, impossibility to access) can have significant political consequences including closing down a programme or losing prestige.

Nevertheless, it is also true that without a strong and decisive move, it may happen that not much progress is ever done. As little is invested on it, not very encouraging results are obtained. And therefore there is no point in investing more, it is a kind of vicious circle or self performed prophesy: "I said this would not work…"

It is neither positive to spend years accumulating good "experiences" that will be seen as little valuable adventures with an enormous effort put on them that cannot multiply themselves nor become systematic working methods. One has to start again, learn how to design courses and materials, learn about tutorials and management and about technologies and costs. One must choose a LMS or try building it, make its Web site and Intranet, etc. In the long run this is very discouraging for everyone.

An alternative to these two trends, avoiding careless rush or fearful slowness, may be to engage into a strong move but in stages. To anticipate the resources to carry out an in-depth work in a big scale; to start a test programme, assess it and correct mistakes and, except for problems that are impossible to solve, progress towards an expansion as a whole, possibly in annual steps.

Three or four years for a programme of this kind to develop is a reasonable time. Ten years is not.

Or is it?

4 Such as INA in Costa Rica.

Location in the institution

Which is the best place to locate a programme of this kind?
After all, does there have to be one programme or will it be better to have a set of articulated programmes?

There are several possible locations for the activities of DL with NICTs in vocational training institutions. The most adequate one will probably depend on the history, features, possibilities and strategies of each institution. To help you imagine possibilities, here we will review some of the problems implied in that decision.

DL, NICTs or what?

As I have already said, when there is a department or area of DL, the most logical thing to happen is that DL with NICTs should be addressed from there. Creating a new one for e-learning is wasting the experience in DL and, perhaps, favouring an assumption that considers the new area to be mainly technological and not pedagogical.

But it may happen that this new programme is created much more linked to the use of NICTs as support for educational activities in general. IT departments sometimes expand towards that direction as part of their own initiative or due to requests performed by other areas of the institution. Their activities are, therefore, not only on DL but on several means for all educational methods including face-to-face learning. If apart from that, there was not an area for DL or it was weak, it may be desirable to keep the same location. Then, what seems necessary is to strengthen it with other specialists in education, communication and DL. The technological specialists cannot direct this area on their own.

Another alternative is that this area is developed in a department for the production of materials and educational means that has worked mainly with "old" ICTs. In such a case, the reinforcement will have to be done by introducing specialists on NICTs and DL. The same applies for the cases when they are born in pedagogical support departments, in which case it may also be necessary to incorporate communicators.

In fact, what I am trying to make you remember is that this is an area where several disciplines converge (see Chapter 1).

Specific team vs. a method incorporated to all areas

A team who is in charge of running the distance learning courses with NICTs can be a good option, particularly at the beginning, in order to give soundness to the experience. There is a risk that these activities are regarded as a separate thing by the institution and remain isolated from the rest. They could even be seen with distrust or as if they belonged to another institution, losing the possibilities of mutual learning.

Another possibility is that multiple experiences may have been arising in each department or thematic area. Then there will be DL activities with higher or lower use of NICTs in basic or higher training, industrial training, service learning, etc. leading to a natural insertion into each area which is adapted to the specific educational needs. Besides, if some kind of articulation is implemented among them, it may also allow to compare different types of teaching actions and experiences and to benefit from the best features of each of them. This articulation will be necessary so that no learning efforts are repeated and in order to avoid multiple technological purchases which would turn out so varied in shape and format that would make working together impossible.

The ideal thing may be combining both methods profiting from the advantages and reducing the disadvantages of both. An example may be a central unit closely related to the different areas that provides services to all of them and works in joint teams for each course.[5]

Geographical centralisation-decentralisation

This issue is of major importance in institutions with broad geographical scope. Courses prepared in the headquarters may not work properly in every region or town, or may need too important local adaptation efforts. Even when it is intended to make a centralised production, it may be useful to leave "holes" to be filled by the regional or local centres. The duties corresponding to each centre during the development of the courses must be clearly stated.[6]

Strongly autonomous decentralised programmes are capable of guaranteeing more contextualized work, encourage experimenting and creativity, and en-

5 It is also the case of INA in Costa Rica as per what was discussed with the people in charge of it.
6 SENAC in Brazil does it this way (SENAC, 2004b).

sure greater commitment with the task. Then, they will not be perceived as "the courses that come from the top". If they are not articulated in some way, efforts may be doubled and knowledge wasted.

The ideal thing may be working out methods that combine both aspects. An interesting solution is making regional centres work specifically in those areas and courses for which they are better qualified and share their production with the rest of the centres. It is produced in a decentralised way but it is used in all centres.[7]

It is important to remember that close tutorials with possible face-to-face consultations, meetings and workshops may be important and useful tools in the programmes. That is why having a big "permeable" net throughout the territory is very advantageous.[8] DL programmes are, themselves, a type of educational decentralisation, but the previous physical decentralisation promotes its development.

NICTs provide decentralised but articulated working strategies. Advertisers who work alone can work together with the big teams and projects (Bates, 2001), and the local initiatives with the central ones.

Own or outsourced production

Some vocational training institutions have outsourced almost all their educational activities.[9] They only establish general policies, manage founding and control the quality of the services. For those institutions this new area will also be outsourced.

Others, however, directly perform teaching but may prefer starting the activities in this area in a totally or partially outsourced way[10] only while they learn how to do it or at a long term basis. From my point of view, total and long term outsourcing of only this area may turn it into an isolated island. Perhaps it does not have the flaws of the institution but it will neither benefit from mutual learning.

When outsourcing is partial it is important to think which aspects shall be handled by others and for how long. The contracting conditions and the agree-

7 According to its staff, SENA in Colombia works in this way.
8 As the people in charge of SENAI in Santa Catarina (Brazil) stated.
9 For example SENCE in Chile.
10 As INA in Costa Rica did.

ments to be made are also important in order to ensure the later retrieval avoiding depending on the supplier, as we mentioned in previous chapters. If the area is important for the institution, my view is that at least the pedagogical management of the courses and programmes should never be lost. It is barely easier to outsource or contract services on other aspects (production of materials, technological support).

In sum, it can be originated at the departments or units of DL, NICTs, means and educational materials, or pedagogical support. The options are a specific team or a team incorporated to the different working areas, and a centralised or decentralised production strategy with own or outsourced production. There can also be several combinations of these alternatives.

Which alternative did your institution choose and why?
or
Which one do you think is more appropriate for your institution in case it will be starting a programme?

And reintroducing the previous items,

Where did you start? How fast did your institution start?
or
What would be the convenient starting point and the adequate pace?

To end up (or to start)
Learning and teaching in the Internet age: Risks and opportunities

Learning and teaching in the Internet age: Risks and opportunities

In order to conclude, I would like to review some of the doubts that arise regarding the so called e-learning and some of the controversies among the concept and its practical aspects. These are controversies among risks and opportunities, changes and continuance.

A democratising opportunity?

In part: it makes it possible to contact people who were unreachable before or were very difficult to reach. But still, there are sectors to which NICTs are remote.

To profit from the democratising opportunity and avoid the risk of discrimination, mechanisms to provide access to it will have to be found: IT rooms, payment of cyber cafes, coordination with programmes of digital inclusion, etc. It will also be necessary to add other tools, online and offline work, etc.

An opportunity to reduce costs?

Sometimes, when the distance from the students is large and they are very scattered. Furthermore, when the scale (amount of students, course life span) is too big.

But in general the answer is no. The technological infrastructure and the production of materials are expensive and the work of teachers does not disappear (as it was once thought).

Teaching without teachers?

As I have just said, usually the answer is no. Good systems have, at least, tutorials. Besides, there may be additional teaching positions (monitors, coordinators, etc.). The time devoted by those teaching teams is equal or higher to that involved in classroom-based teaching.

Furthermore teachers work hard in the production of materials. Those who produce them may be directly involved in the interaction with students and that is something positive (there might not be a separation between the production of materials and the tutorials).

Distance learning?

Yes, but evolving into "no distance" learning. On the one hand, that happens due to the search of a greater interaction between teachers and students, and the students themselves, with the society and the professional practice.

On the other hand, due to integrating face-to-face activities that make it possible to create personal bonds, form groups, interact in an easier way, and perform physical operations that are not easily "virtualised".

That is why it is appropriate to think of a continuum between distance and attendance, selecting one or the other depending on the type of educational process in each case.

Moreover, working adequately, the "distance" may turn to be smaller than that of many regular massive classrooms where teachers are not able to identify their students and have little interaction with them.

Flexible education?

Yes, regarding time and place, and the study and learning pace of each student. At the same time, it requires discipline and the adequate conditions (at work or at home) which not everybody has. Because of this, dropout levels may be high.

On the other hand, flexibility in time is relative. When there are tutorials, it is frequent that the starting and ending dates are the same for everybody.

Besides, there exists a risk of inflexibility in DL: students study at their own pace and follow the instructions with no differences between students or groups,

and without taking into account what is being produced. This risk is greater in "packed" courses than in progressively produced courses or in courses with holes (Chapter 7).

Self-learning or inter-learning?

The idea of self-learning may promote autonomy and responsibility but the social factor of part of the learning processes may be lost.

Therefore, profiting from the dialogical possibilities involved in NICTs seems to be the key. A world of opportunity opens up here and goes side by side with the next question.

Isolated learning?

Apparently this has been the paradigm and even the aim that promoted several projects on DL and at present it is still important: everyone learns on its own, when each wants and can…

There we see how the social factor of learning is lost, something good programmes usually try to recover.

One-to-one education?

…which is not the same as isolated: it gives the possibility of working personally on the requirements and needs of each student.

We could try constructing algorithms to anticipate all the possible paths of personal learning. It is complex and not always possible. Besides, we do not have much experience in this part of the field of VT.[1]

The other possibility to individualise teaching is intensifying the tutorials. That means more time of the teacher for each student. But of course, it is not always possible to offer so many resources to that.

What can be clearly seen is that there are potentially more possibilities of carrying out this individual chore that might even derive in structuring a different activity for each person or group.[2]

1 An example is *Caminhos de aprendizagem* by SENAI-SC (Brazil). It helps constructing the route of the personal curriculum. It can be seen at www.didatix.com.br .

2 The team of Cinterfor / ILO (2004) went through a process of this kind in the Programme on Quality and Equal Opportunities in Vocational Training.

Student centred?

It is usually said that the centre is not the teacher any more but the student. However, in fact, many times the centre turns to be the material that substitutes one of the traditional roles of the teachers: transmission of knowledge.

This provides the opportunity of reconsidering the role of the teacher, who can devote much more time to speaking with students, encourage research and the construction of students' own knowledge.

But it is also a risk: the material and design of the course can emphasise the exogenous and transmission-focused approach of teaching (see Chapter 3).

Interactivity or interaction?

Interactions are key issues to the learning processes, as I have said and explained at length in Chapter 3. But it is not the same having a relationship with the computer and the software programme (interactivity) than with other people (interaction).

Stimulating discussion or opening up forums is not enough. Usually they do not work properly or repeat the structure of teacher's question – student's answer.

Activities in small groups, the link to everyday tasks, debates and challenging questions are some of the key issues for interaction to take place and be a source of learning. None of these are easy tasks, starting by group work, which is usually idealised but not really benefited from.

All these items which have to do with the interaction are mainly pedagogical and not technological problems.

A pedagogical revolution?

Those who worked in regular teaching, when they started working on e-learning faced the need of explaining much of what they did and that made it more visible and questionable by others and by themselves.

People who had never focused on pedagogical issues are now paying attention to them. They even question what was or is done in the regular classroom when discovering new dialogue opportunities with their students.

Many of the possibilities had their role in DL with the "old" technologies

and in regular classrooms. Those who rarely have face-to-face conversations with students will probably find it very difficult to exchange ideas with their distance learners. And those who deeply support a certain pedagogical approach will find it difficult to change it.

That is why the risk of e-learning being "a pedagogical revolution with no pedagogy" exists mixed up with the idea of "electronic learning". Learning is, above all, a human activity. In that sense, there is no electronic learning in the same way there is no "printed learning". Most probably the term e-learning leads to that confusion instead of clarifying it.[3]

In all cases the risk of e-learning becoming a "backward revolution" must be avoided and I think it is avoidable. Some pedagogical and methodological options can emphasise the most negative features of the traditional classroom-based teaching methods or of certain versions of DL: inflexibility, lack of dialogue, little critical thinking, student's isolation, etc.[4]

Opportunities and risks

Undoubtedly NICTs are here to stay. And they have clearly had a strong impact on our lives. And on education too. In that sense, NICTs are not a passing fashion.

However some of the "e-…" are not as clear. Some of them have already gone through a crisis as the bubble burst of the year 2000 in which many Internet enterprises, particularly those based on e-commerce, closed down or dramatically reduced. E-learning has also gone through fluctuations between euphoria and disappointment and has finally found a balance.[5]

It is about making the best possible use of NICTs (and also the "old" ICTs), as their names suggest, for information and communication purposes. Probably many of these technological "solutions" will go out of fashion. In any case, real pedagogical revolutions will continue to be pedagogical, such as those conducted by Piaget, Vygotski, Maturana, or Paulo Freire…

DL with NICTs opens a broad field of opportunity; and of risks too. I hope vocational training takes advantage of the opportunities and avoid the risks. And I hope this book contribute to that purpose.

3 Cfr. Kaplún, 2001a and 2005 and Chapters 2 and 3 of this book.
4 See, among others, Huergo, 2000, Gatti 2001; Aparici, 2004 and Chapter 3 of this book.
5 See Aranda (2005) and I-World (2005).

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