INFORMATION AND COMMUNICATION TECHNOLOGIES AND VOCATIONAL TRAINING
REFLECTING UPON LESSONS LEARNED AND CHALLENGES AHEAD

CONTENTS

ACKNOWLEDGEMENTS

INTRODUCTION

Living in the 21st Century, in the Knowledge Society, shaped by constant scientific progress and the will of economic and cultural globalization, implies, above all, recognising and appreciating the penetration of mass media and computers in every dimension of life together with a permanent increase in information, more and more audiovisual, multimedia and hypertextual. Therefore, conceiving our present culture and social reality means acknowledging the irruption of a new way of culture, characterised by the overlapping –if not by the pure and simple substitution– of the screen culture with the book and interpersonal relationships culture; in which Information and Communication Technologies, lifelong learning and knowledge management are synonyms. They are its main pillars and mandatory components of competitiveness, economic progress and the future of people in order to advance towards the continuous improvement of quality, relevance and equity of the policies to implement.

In the field of training for work, the meaning of these pillars and, particularly, the presence and contributions of information and communication technologies (hereinafter referred to as ICTs) has been reaffirmed and bolstered by *ILO's Recommendation 195 of June 2004 on Human Resources Development: education, training and lifelong learning*, which is the most recent and large-scope framework of reference on the main issues of this field of action.

Vocational and technical training in Latin America and the Caribbean, always alert and committed to the changes and challenges of labour and education scenarios, has been making remarkable human and material efforts to analyse, appreciate and incorporate these dimensions into its action-taking. Introducing and spreading innovation always creates instability in the context where it appears, particularly during the first stages of dissemination. This is why permanent and collective feedback between conceptual development and implementation experiences is so important both to understand this instability as a part of the change process itself and to minimise its costs and advance as fast and firmly as possible towards a qualitative leap that will restore balance.

This paper has been precisely conceived as an input for this feedback gathering task and the collective construction of alternatives and knowledge about the impacts of incorporating ICTs in training-for-work policies. It seeks to visualise the current state of the art in terms of research, findings, lessons learned and challenges ahead. It is the result of the exchanges among multiple VTIs in the region and it intends to systematize questions, difficulties, advances and experiences developed during the last few years. The exchange has been channelled through different means: workshops, surveys, forums, description and self-assessment of own experiences and visits to other institutions, Skype conversations, etc. It is part of a broader reflection upon social policies and, particularly, the regional vocational training system and the need to build a harmonious and integrated relationship between quality, relevance and equity in the actions developed. In this sense, the intention is to give continuity to the reference document on such approach presented at Cinterfor's 37th Technical Meeting, but this time focusing on the presence of ICTs in the training process.

This material is under process, incomplete and requires constant revision. It is enriched by every application and all the contributions of the stakeholders who are engaged in these issues.

The first two chapters are devoted to the conceptual and reference framework of ICT incorporation in training and, particularly, to the reflection upon its impacts from an integrated approach on quality, relevance and equity. The third one systemizes the main changes and the conceptual evolution regarding the use of ICTs and e-learning in the training context of the region. In the chapter that follows, several Cinterfor/ILO member institutions and the Centre itself present their projects and practical experiences of e-learning. As a result of this content feedback, the document finishes with the identification of the main challenges ahead to be faced collectively.

The aim is that it may serve as a means of showing the progress made by Training Institutions, analysing some of the issues raised, integrating the lessons learned during the different stages of the evolution, contributing to conceptual development and problem-solving, etc. In sum, it seeks to go on building and improving the relationship between ICTs and training for work.

CHAPTER 1

Incorporating ICTs
in vocational training in Latin America

Members should identify human resources development, education, training and lifelong learning policies which... stress the importance of innovation, competitiveness, productivity, growth of the economy, the creation of decent jobs and the employability of people, considering that innovation creates new employment opportunities and also requires new approaches to education and training to meet the demand for new skills...

Art. 3c – ILO Recommendation 195

E-learning and new information and communication technologies (ICTs) have become part of educational practice worldwide and also in the regional technical and vocational training community. Concerns for innovation and for offering the appropriate response to changes in the labour and education world have been a constant action-taking pattern of VTIs. Therefore, it is not surprising that there has been a strong commitment to introduce ICTs in teaching-learning processes during the last decades. It seems to be quite appropriate, therefore, to look back on what has been done and think about the future; about how to proceed and where to go.

In order to fully understand the impacts of this incorporation we suggest organising it in two big areas:

- ICT training, that goes from the acquisition of basic competencies to use computers, to specific learning on hardware and software and its use for the improvement of productivity and employability.

- ICT-based training, that is, the way in which the institution provides training; it goes from the design of digital teaching materials to ICT-based training and virtual education.

The term e-learning will be used in this document to refer to the incorporation of ICTs in any training modality. We do not restrain its use to distance or virtual training but we rather extend its scope to "blended learning" (training that combines distance and face-to-face training and, therefore, uses a variety of resources) and even classroom-based training with some ICT components. The relevant distinctions will be made whenever required by this analysis.

The amount of space filled by computer training, office applications, programming, repair and administration of networks, etc. in the institutional training offer, proves that it is the area that has advanced the most. It is a conclusive proof of VTI's will to give a quick answer to the multiple requirements of sustainable and equitable economic and social development and those of the labour world.

Present economic and social development is sustained by work, whose main performers are men and women. At the same time, work is a primary component of people's life project, self-assertion, self-esteem and social inclusion. Sustainable economic development requires constant improvement of productivity and competitiveness. Equitable social development ensures equal access and enjoyment of resources and benefits for all the members of the society, regardless of sex, physical and cultural characteristics, their age, dwelling place, etc.

ICT training is crucial to economic and social development nowadays and also to two central issues of VTIs: improvement of productivity and employability. From industries to SMEs, the problem of productivity has been long present in our region. The correlation between productivity and the effective use of ICTs can be relativised in highly technological and industrialised societies, but the necessary leap in our region is clearly farther and inevitably requires training.

The most diverse industry, trade, services and even rural processes are applying ICTs both as a support of the process itself and to consolidate the interaction among markets and strengthen research and innovation. Since the advent of the Internet in 1991, a vertiginous expansion rhythm has been observed: in only five years, the number of users rose from 600 thousand to more than 40 million and, nowadays, that rhythm is doubled every 53 days.

As a result, the prominent role that training will play to increase productivity becomes evident. We need workers who are better qualified and who are capable of operating ICTs, which will, in turn, improve the efficiency of the relationship between manpower, capital and infrastructure. Including ICTs in in-focus programmes for industries and, particularly, for SMEs, which have a primary role in Latin American economies, is

an urgent challenge for the regional training system. A new enterprise's chances of success in this knowledge society largely depend on its ability to become integrated into networks of suppliers, experts and consumers who are located anywhere in the world and who are easily reachable through ICTs.

At the same time, and in order to face the constant changes in contents and the way of doing things, people need to know themselves and the reality they live in, acknowledge and appreciate their own abilities and limitations according to the demands, characteristics and perspectives posed by work and today's social organisation. Accordingly, the focus is brought into strengthening employability, understood as the *"... portable competencies and qualifications that enhance an individual's capacity to make use of the education and training opportunities available in order to secure and retain decent work, to progress within the enterprise and between jobs, and to cope with changing technology and labour market conditions (Recommendation 195 – Article 2d).* Competencies in the use of ICTs are, hence, part of the basic competencies of employability; and moreover, it does not seem possible to conceive literacy in today's world without thinking of digital literacy.

As a result, commenting on and discussing about the ways in which ICTs are included in the curriculum, the teaching strategies used to do so and the motivations behind the inclusion and the effective participation of VTIs in digital informatization and literacy at a national level, appears to be utterly necessary.

Although it is in the area of ICT-based training where institutions seem to be more cautious, the advent of ICT-based distance learning (DL) and e-learning and its prospective coverage extension and cost reduction have led all VTIs in Latin America and the Caribbean to develop it to different extents.

There is a growing demand for this kind of training and it will probably remain axial for quite a long time. Scarce free time and long distances make it difficult for people to attend courses on a regular basis and for a long time in a training centre; it is particularly the case of people who are already working. In addition, rapid changes in all areas of knowledge, particularly in science and technology, demand constant acquisition of new competencies in order to respond to new ways of learning and doing, which translates into postgraduate, specialisation and trainer training demands, among others. Enterprises are equally becoming aware of the growing need to engage their workers in lifelong training. Consequently, it is likely that the training demand will continue to increase.

Additionally, the development of skills and competencies that are directly applied on the job is spreading due to the realisation that there is a non-fulfilled demand derived from the little relevance of educational coverage and the pressure of early labour insertion. The belief that ICTs can only be used with a small group of selected and "highly technified" occupations has been abandoned in view of the experience that several institutions already have.

This is why the offer of ICT-based distance courses includes areas that are no longer exclusively theoretical. A certain "virtualization" is being observed in the handling of teaching objects that is made through the Internet in order to develop skills in areas such as food preparation, nutrition, animal care, risk prevention, building skills, etc.

They are all market niches, or, seen from a different perspective, demands that VTIs may take into account through the development of new virtual teaching-learning environments, avoiding the constraints of time and space of face-to-face teaching and improving the flow of communication between students and teachers. In the same way, telematic teaching resources – such as IT and telecommunications that may be used at home, in teaching centres or at any other place with Internet access - are becoming more popular as a supplement to (or as a part of) education requiring full or partial attendance. They enable institutions to set the basis for providing a more flexible and relevant training that matches local realities and the profile of the target population.

Incorporating these teaching modalities has raised several debates among members of technical teams concerning the possibilities offered by ICTs in terms of alternative teaching techniques instead of those used in traditional face-to-face education. Although the debate is still in process, some consensus has been reached regarding, for instance, the conviction that the e-learning model associated to a lonely participant, exclusively relying on Web-based materials and without tuition cannot develop quality training. As a result of these observations, course designers have proposed a deep revision of educational technology.

The necessary condition for this revision and to offer ICT training and ICT-based training is then to have teaching staffs that are not only trained in their specific areas of expertise but are also competent enough to handle technologies and develop teaching resources and methodologies based on their application. It becomes more evident that the incorporation of ICTs in the teaching-learning process will have a strong influence both in VTI's ability to respond and the quality and equity of the training they offer.

CHAPTER 2

ICT and Vocational Training:
from an integrated approach of quality, relevance and equity

"Education and pre-employment training include compulsory basic education incorporating basic knowledge, literacy and numeracy skills and the appropriate use of information and communication technology"
Art. 6.2. – ILO Recommendation 195

As stated by Cinterfor/ILO in a document with the same title, in vocational and technical training in the 21st Century, "Quality, relevance and equity are (…) three dimensions that are closely interrelated and cannot achieve or fully satisfy their specific objectives unless they are linked together and coordinated. The effects that vocational training policies pursue are placed in this critical area of integration …"[1] Of course, it is not easy to coordinate and integrate this inter-dependence in practice. However, the accumulated experience has shown that such inter-dependence is what is required to approach the contemporary labour scenario. Therefore, it should orient the actions of training policies in order for them to fulfil their basic responsibility of being the meeting point of the goods and services, productive systems and those who produce, who are at the same time the target of training. Individuals are the target: women, men, rural people, young people who wish to enter the labour world in the near future, employed and unemployed workers who seek to improve their work situation, etc. But collective subjects can also be targets: enterprises wishing to increase competitiveness, improve processes and find new products and services; organisations and local and sectoral actors needing to improve their roles and responsibilities in economic and social development. They should all be addressed by appealing to **quality** in processes and results, **relevance** regarding the demands and needs of the productive environment and its characteristics and conditioning factors (double relevance) and an approach on **equity** that seeks to overcome obstacles and solve problems that create inequalities.

It is clear now that in order to fight against the decent work deficit that affects the world, and particularly our region, new growth strategies need to be developed so as to create more and better jobs for everybody. This requires integrating economic and social policies and developing and increasing individual and collective competencies for innovation, competitiveness and productivity through dialogue, participation and the complementation of actors and resources, public and private affairs, national and territorial levels and the standardised /universal and the focalised / singular. Seen in this way, it seems evident that the common denominator is the generation of synergies; an isolated measure or resources is not enough, interaction is required. This leads to adopting a systemic approach as a thought model in order to understand and operate in the productive system and the labour world.

The implementation of new job-creation strategies is related to the quality of the response and the interventions in the economic and productive system. And the need for decent work for everybody places us before the need to guarantee non-discrimination to access or to keep a job, as well as equal opportunities and treatment. As a result, primary responses to this challenge were centred upon the improvement of quality and equity but taken as isolated objectives and considered separately. This search began to promote the evolution of both concepts. Obviously, this evolution has not been lineal since it was adapted according to the economic and social changes in different contexts, considering the achievements made and the lessons learned. A systematisation exercise allows us to identify three stages in the conceptualisation of both dimensions.

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[1] Cinterfor/ILO: Quality, relevante and equity. An integrated approach to vocational training. Training Features, Montevideo, May, 2006

QUALITY is:	**EQUITY** is:
1) Compliance of an object, material or non-material, with a standard, criterion or pattern. The agreement between specifications and the achieved product implies having control over the product so as to achieve conformity or compliance with the standard.	1) Having a legislation that guarantees equality and forbids discriminations: ensuring equity before the law.
2) Meeting the demands and requirements of external and internal clients: efficient process management to avoid non-conformities.	2) Distributing resources to disadvantaged individuals and groups; overcome dissatisfaction with the employment situation due to lack of it or poor conditions.
3) Achieving excellence, as better as possible: building quality through continuous improvement.	3) Promoting changes in structures, institutional practices and organisational modalities in order to attack the causes of inequity and achieve the redistribution of resources and benefits ensuring equal rights, opportunities and treatment.

The comparison shows that these three stages correspond to similar theoretical and strategic positions and that each of their objectives do not exclude but complement each other. This leads to an approach on quality and equity that takes both dimensions as inter-dependent; they share a double relevance that is a condition for their existence: the productive and social environment and the target population. They integrate legal and standard aspects, address and fulfil the specific needs of target subjects (clients, in quality jargon) and create new attitudes and knowledge for continuous improvement.

By applying this conception of vocational training, we conclude that a training policy based on quality, relevance and equity should:

- Fulfil the minimum requirements and processes according to its objectives so as to obtain good results. [*compliance with regulations*]; have the necessary teaching staff, infrastructure, curriculum development and pedagogical strategies to offer quality to everyone and ensure that none of these dimensions entail any form of discrimination, whether explicit or as an obstacle that prevents or limits access for different target subjects;

- Have the ability to adapt their teaching solutions and educational technology to the needs, expectations and requirements of the productive system and of those who produce [*satisfaction of actors, users and clients; integrating the general to the specific*]; A training that is considered as double relevance, adopts a systemic approach, seeks to contribute to the improvement of productivity and competitiveness as well as to the reduction of social, sectoral and territorial inequity;

- Promote changes, increase opportunities by creating new knowledge and attitudes and strengthening learning to learn and to unlearn [*towards the better possible, towards continuous improvement*]; manage knowledge according to the generation of new institutional and individual competencies for innovation, the improvement of competitiveness of enterprises and sectors (its collective target subject) and of employability and citizenship participation of men and women (its individual target subjects).

How do we advance towards quality, relevant and equitable training in the knowledge society and in the irreversibly installed technological culture? What are the impacts? What benefits and risks does the massive incorporation of ICTs in vocational training bring about from the perspective of this integrated three-dimensional approach? This document intends to reflect upon these questions: not in order to provide answers, even less, close and final answers, but to raise awareness and contribute to a continuous and collective reflection to which the vocational training community of the Americas is committed.

TECHNOLOGICAL CULTURE AND TEACHING-LEARNING PROCESS

To begin with, it seems convenient to make a quick revision of the relationship between culture and education. By *culture*, we understand the set of conduct rules, ideas, values, ways of communication and acquired (non-innate) behaviour patterns that are distinctive of a certain social group. That is, everything that we, human beings, have been able to create that is outside nature and that provides us with the behaviour environment in which we develop as subjects and to which evolution we contribute. In addition, *education,* initially provided within the family and then by educational institutions, transmits to us the particular features of our culture and should give us the chance to develop our own abilities and creativity.

The cultural environment in which we are immersed is that of technological supremacy, massively spreading its IT, telematics and audiovisual means of communication that open up new communication channels (networks) and huge information sources; powerful information processing instruments; new values and rules of social behaviour; new symbols, narrative structures and ways of organising information; electronic money, etc. It is in this technological culture that our vision of the world is shaped; our behaviour is radically different from that of our parents and grandparents.

This new culture changes the notion of what to learn and how and, therefore, the organisation of training. Excessive, disconnected information can only be turned into knowledge if it is contextualised. To do so, people do not only need basic digital reading and writing skills, but also proficiency in English, ability to put in context and understand, in a critical way, the information coming from the reality, which has multiple sources, in order to create choice criteria and make decisions. People also need to mobilise and adapt knowledge and skills to new circumstances in order to have more alternatives, anticipate threats and opportunities, integrate and develop a systematic vision of reality, organise, plan and manage information and the time it demands. ICTs do not only apply to productive activities but to everyday and citizen life. Without them, isolation and exclusion would be irreversible. But all these competencies equally require personal skills (reinforcement of self-identity and personal and gender confidence, self-responsibility and involvement in the own employment-training process, autonomy), interpersonal or social skills (teamwork, responsibility and self-regulation, personal relationships, negotiation skills, ability to listen and communicate, emotional detachment in work situation, etc.).

It would seem that it is not enough to add to the curriculum the eleven dimensions of digital literacy that have been recently identified and regarded as essential to all citizens[2] : knowledge about IT systems (hardware, networks, software); use of the operational system; information search and selection on the Internet; interpersonal communication and network-based cooperative work; word processing; image treatment; use of spreadsheets and databases; ICT-based learning; tele management; general attitude towards ICTs (critical ability in view of contents and entertainment; responsible message management; critical files; etc.

It is obvious that in a few years, those who do not know how to *read* digital information sources (TV channels, media libraries "à la carte", cyber libraries and Internet in general), or *write* with IT word processors or *communicate* through telematic channels, are going to be considered as illiterate, and they will be affected by a new form of cultural exclusion and will be in clear disadvantage to manage in society. We cannot, of course, leave this challenge entirely in the hands of the educational centres, even less in vocational training ones; it requires the involvement of all political and social circles.

Nevertheless, regarding the specific features of the teaching-learning process it also implies an important change: focusing on the person that is learning and seeing him as a situated subject conditioned by gender, race, personal and familiar history, economic, social and community environment, etc. but capable of changing his initial situation through individual and collective strategies and appealing to all of his resources: cognitive, affective, behavioural, etc. This concept of people is the one proposed by gender mainstreaming as an instrument of analysis of social relationships and of the classification and hierarchical criteria. They appear in every circumstance, institution and training environment and they are reinforced by curriculum development, teaching practice and supply in general.

Just as it was said in Chapter 1, the focus on training for employability and active citizenship leads to people's strengthening and awareness that they have a leading role in their own teaching-learning process. It

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[2] Consell Superior d'Avaluació del Sistema Educatiu de la Generalitat de Catalunya together with Asturias, Baleares, Canarias, Castilla-La Mancha Autonomies, Valencian Community, Basque Country, Murcia Region, research coordinated by Pere Marquès Graells: http://www.gencat.net/ense/csda

also provides them with the competencies they need to manage opportunity strategies. This baggage is particularly necessary to rescue the more economically and socially diminished sectors and provide them with the tools to acquire mobility or look for their own labour solutions (freelance work, micro-enterprises or other activities that may still be competitive despite their limited technological appropriateness) after the loss of a job post or a staff reduction in massive and traditional jobs.

ILO's Director General, Mr. Juan Somavía, states that: *"The ICT revolution offers genuine potential, but also raises the risk that a significant portion of the world will lose out. Let us strip out the hype. What is left? What's left is its effect on peoples' lives, wherever they live. We need to promote policies and develop institutions which will let everybody benefit. And it won't happen on its own."*

These challenges, in the field of training for work, require all forces in politics and training practices to reflect and think about their responsibility in and how they can contribute to training for employability based on quality, relevance and equity.

With these objectives, multiple entities in the region have begun to incorporate project-based work as a teaching strategy since competencies for employability and citizenship are necessary to design and manage the different stages of a training or employment project. The training institution becomes then a companion on the way, accompanying the occupational projects of its students. Teaching practice also changes: the teacher is no longer limited to facilitating the acquisition of knowledge and the technical competencies specific to the area of expertise; they are also supposed to promote the development of employability competencies, particularly ICT ones. Moreover, teachers nowadays are not and cannot be the absolute and final owners of knowledge. In the same way, the classroom is not the only possible training space; therefore, our concern is no longer teaching and its contents but learning and its process.

ICT inter-dependence, training for employability, teacher training and new teaching methodologies are becoming, in a clearer and urgent way, conditions for the double relevance of training and, hence, an integrated approach of equity and quality.

INCLUSION, DEMOCRATISATION AND ICT

If we only focused on equity, we would have to concentrate on three further issues: the different kinds of equity involved in the use of ICTs in training, the relationship between ICT and gender and ICT's role in the spread of vocational training enrolment.

Although equal opportunities are not the only component of the modern concept of equity, it is still the most frequent and evident indicator. A certain population group's differences in the access to the ownership of a highly appreciated social resource represent the measure of the degree of equity: the smaller the differences among groups and persons, the more equity in the distribution of such resource. The relationship between ICT and training allow for several possible equity measurements from an indicator of equal opportunities. Firstly, equity linked to the access to training mediated by ICT and based on its cost, which may be called financial equity: access is restricted to those who can afford it.

Secondly, we find technological equity, which consists of the differences in access possibilities depending on the knowledge of the applicants to the educational technology used in the training offered. It also includes the access possibilities according to the availability of resources and IT and telematic equipment. Those lacking the necessary technological means and network facilities for distance learning will not have access to this kind of training; in other words, this training scenario will be more or less equitable depending on the level of sophistication of the means and the equipment required.

More recently, digital equity has been defined as the measure of the size of the digital divide among individuals, groups, organisations and societies. Digital equity refers to the access to technological resources for learning to all people. It has several dimensions: contents creation (opportunities for learners and educators to create their own contents); quality and cultural relevance of contents (possibility and opportunity to access high-quality digital contents); effective use (employment of technological resources by qualified educators in teaching and learning) and effective access to the technological resources planned for learning).

The more and better opportunities to fulfil all these dimensions, the greater the digital equity of a virtual or distance training programme. In this way, quality becomes an instrument for equity and vice versa.

In order for digital equity to exist, the training offer should minimise individual differences and avoid elements that may favour discrimination and exclusion. Digital equity implies that all applicants who have the access requirements can have access and remain if they fulfil their job satisfactorily and cannot be excluded for extra-educational reasons. In Latin America steps are taken to promote ICT-based training but still without a homogeneous support of the existing infrastructure and without solving the access problem. Likewise, great disparity is observed among countries and inside them in terms of demographic coverage, where modern sectors coexist with others who linger behind in terms of access to digital educational technology and its allied technological resources. In regional vocational training an awareness of the obstacles to the introduction of ICTs lives together with an open interest to carry out the necessary efforts for its incorporation, use and dissemination. That is why knowledge and debate are so necessary, both on the potential opportunities ICTs may offer to countries and its real impacts and manifestations in diverse contexts and social groups.

Two clear examples follow that illustrate the convergence of these three equity measuring criteria as well as the need to adopt an integrated approach.

Gender and ICT

We have already talked about the contributions of the gender perspective to double relevance and to strengthen the active involvement of subjects in the teaching-learning process. But the gender approach also warns about the dissimilar opportunities and risks between men and women implied by ICTs. 2001 ILO's report on world employment "Life at Work in the Information Economy" states that "information and communication technology (ICT) development offers a great number of new opportunities for women. However, unless these possibilities are supported by a thorough design of policies capable of ensuring participation, responsibility taking, education and training in ICT for women, as well as family support policies in workplaces where information economy is developed, the old risks linked to gender will persist".

The concept of "digital divide" is particularly based on the inequity and inequality patterns existing in society. Along with an exponential growth of Internet users, it has been observed that it is no longer a men-dominated scenario, since the current rate of women mounts to roughly 45% of the total of Internet users and 50% in industrialised countries. Nowadays, women take the lead in the growth of new connections.

ICTs facilitate distance work, enabling women to accommodate their work and family schedules in a better way. Furthermore, new jobs in the services sector that appeared as a result of technology development are creating new labour insertion alternatives for women.

ICTs offer women the opportunity to expand their projects and change their social, political or cultural situation. They are enabled to access information and communication from any place at home or even from remote places, while promoting all kinds of contacts: cultural, economic, political or social. Additionally, they have great potential to create and spread work on networks. Despite all these advances, *ICTs are not neutral regarding gender*. Inequality between men and women is maintained, being more significant in less developed countries, and should be taken into account in any study that wants to be made on development possibilities. These differences are a barrier that favours the growth of the already existing divide. Women are not traditionally associated with technology and they are even said to have a passive attitude towards it. Reality shows that persisting barriers can inhibit or limit women's access and use of new technologies. These barriers are related to socialisation patterns and the segmented access to education and training.

Illiteracy and low language training levels are clear hurdles. Enough to say that two-thirds of the world's illiterate are girls and women. For Spanish-speaking women, for example, the predominance of contents in English is a great limitation. To overcome these barriers, applications such as multilingual tools and databases, graphic interfaces for the illiterate and automatic translation software should be developed. Poor access to financial resources to afford the necessary equipment and connection access is another barrier women have to overcome to enter the ICT world.

Technological changes affect women work in terms of quantity and quality. The benefits that new technologies provide to employment also imply higher health and environmental costs. Employment problems related to women who work with technologies are linked to contractual terms, work hours increase, salaries, health and safety. Women's access and control over ICTs is not equal to those of men. Access refers to the opportunity to use them, which not only involves technology, but also information and knowledge. Control refers to the power

to decide on how to use them and by whom. Even though more women are having access to employment and ICT training, it is not the case for access to decision-making and resource control.

All of this shows that although new technologies have improved the living standards of women by offering them new opportunities, they can also become a new discrimination and inequality element since many of the tasks women develop are poorly paid and demand little qualification. On account of the opportunities and risks ICTs offer, particularly in adverse contexts such as the one in Latin America, it is utterly necessary to take efficient measures in order to avoid increasing inequity among men and women. As ILO's Report states in its conclusion, "work in the information economy can be an efficient tool to promote social and gender equity, but only if there is direct intervention capable of eradicating existing inequalities and protecting the needs and rights of the affected women workers".

Enrolment extension and ICT

ICTs are no doubt having a direct impact on the extension of enrolment both due to the ongoing increase in population demands and the coverage possibilities they entail. In the information society, both young people and adults need to make ICTs their own. Young generations assimilate technological innovation in a natural way, while adults have to make big training, adaptation and "unlearning" efforts. Young people do not have the experience burden of having lived in a "more static" society and, therefore, managing innovations and lifelong learning is quite usual. It is precisely for that reason that they expect a computer to be omnipresent at the training centre, from the first courses and with different aims: entertaining, informative, communicative, instructive, etc. However, as we have seen, technological culture is much more than technological operation and enjoyment.

Likewise, and although a more careful analysis would be appropriate here, the ICT equation "lower costs - further coverage - fulfilment of demand" is already installed in the educational scenario. Because of that, the tension between quantity, quality and equity becomes more complex and challenging. It is clear that VTI's options do not seem to be to underestimate the impact of ICTs in coverage but rather to be extremely cautious so that growth does not produce a reduction in quality or equity but the continuous improvement of teaching and learning management. This continuous improvement should be tackled in one of the multiple functions ICTs have in the educational process. According to Pere Marquès Graells,[3] ICTs in education can be used as:

- **Means of expression** (software): writing, drawing, making presentations;

- **Open source of information** (www-Internet, e-centre platforms, DVDs, TV, etc.);

- **Information processing instrument** (software);

- **An instrument for the administrative management of teaching;**

- **Channel of face-to-face and virtual communication** (digital whiteboard, messaging, forums, weblogs, wikis, e-centre platforms, etc.) which facilitate **team work**, exchanges, **tuition**, sharing, putting in common, **negotiating meaning**;

- **Learning motivators**: images, videos, sound, interaction;

- **Teaching means** (software) which informs, trains, guides learning, assesses, motivates;

- **Facilitator of teachers' work**, offering more resources to treat diversity, to do follow-ups and assessments (self-correction materials, platforms, etc.), tuition and contact with families;

- **Evaluation, diagnose and restoring tool** (software);

- **Creators of new training scenarios** (distance training, e-learning, e-centre platforms, network-based learning) which multiply lifelong learning opportunities.

All of this implies developing new knowledge and new competencies to learn and to teach how to learn.

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[3] The impact of ICTs in education: functions and limitations, 2006.

SOME DIMENSIONS AND POSSIBLE INDICATORS OF AN INTEGRATED THREE-DIMENSIONAL APPROACH

The greatest challenge institutional policies in Latin America are now facing is to offer quality, relevant and equitable training for work. There is growing agreement regarding this quest but, nevertheless, we are still far from its fulfilment. Its inclusion in the vision and mission of institutions and in their quality management orientations has spread and several efforts and commitments with continuous improvement are being made to shorten the distance to the goal. It can be observed, though, a predominant tendency towards an unbalance of the three dimensions: they are not developed at the same time, in the same way or with the same intensity. If this is the case for training policy as a whole, it is even more clear in the ICT area and, particularly, for new virtual training scenarios which are combined with the ICT component (hereinafter a part of e-learning). We usually find a training offer of very good quality but extremely expensive or requiring technological knowledge that remains inaccessible for a large portion of the population. Likewise, we find high quality training offers which are not relevant to the labour or social and economic context of the target population and, more frequently, a very poor quality offer with little relevance but having equity as its main principle. That is why we consider that all the efforts and approximations to define the criteria and indicators to assess the level of quality, relevance and equity and the synergic way in which these dimensions receive feedback in e-learning, add to collective progress.

With this aim and based on what is widely accepted in the literature on the subject, we allow ourselves to try the following systematisation of the main dimensions and/or characteristics an e-learning proposal should take into account or include from an integrated three-dimensional approach. It is an exercise meant to be modified, completed and improved through feedback.

- Current e-learning mainly resorts to the same services –which, by the way, are those provided by technology– and, nevertheless, we have the impression that there is a great variety in the types of offer.

- This occurs because what varies from one offer to the other is not the resource pack used but the interconnection among the three e-learning components: the teaching methodology, the roles and profiles of actors and the organisation of ICT resources including both material elements and information. It is on these three constitutional elements, particularly considering the synergies among them, where we should focus in order to assess the degrees of quality, relevance and equity that are being achieved.

- The three elements should concentrate on the subject who learns. He is the target and author of his own learning process. This implies:

  ❖ a methodology that regards learning as an "insight"[4] process, centred upon the person and/or organisation that learns, and related to their specific environment;

  ❖ the student's leading role in his own process, which also demands a reflective attitude. The subject must be a stakeholder and feel as such;

  ❖ a change in the teaching role: he is no longer the source that spreads knowledge and becomes a mediator and dynamiser of the training activity. Additionally, it is no longer an individual and isolated role. E-learning requires a teaching staff that is able to integrate the specific teaching function with tuition; the production of teaching tools with the management of the enabling technological resources; the ability to plan the curriculum with that of adapting it and modifying it according to the needs and signs shown by students. At the same time, teaching tools (documents, guides, support materials) should not only serve as a support to contents appropriation and activity development, but they should also propose exercises to monitor the learning process and enable learners to make their own decisions about the actions suggested. In addition, if training is based on networks, the teaching staff must increase their incidence in the coordination of resources and students: establish the spaces, promote links, identify supplements / potentials of students and their experiences, etc., and, above all, be able to start up, dynamise and sustain interaction;

  ❖ a flexible organisation of ICT resources that favours and promotes autonomy, improves self-esteem and self-confidence. It is the organisation of resources which makes students learn at their pace

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[4] Insight is "realising" or becoming aware. It is connecting an experience, a behaviour, a characteristic of the personality or way of being with its meaning and/or origin, which enables to broaden the awareness and access higher knowledge of oneself.

and with their style, attributes meaning to concepts in connection with their experiences, practice and previous cognitive schemata, thus being able to confront them and strengthen or change them, and, therefore, learn and unlearn. It is resource organisation what leads us to define systems that are based on means, contents, teachers or students. A virtual platform that only admits one way of operating creates insecurity and discouragement and it is clearly not conceived from the point of view of the user.

• E-learning should be methodologically, pedagogically and technologically open. Being open refers to the possibility to adapt to different and changing situations that allow for the intervention of the target subjects from the perspective of their individualities.

❖ An open methodology enables students to move freely within the training environment, progress at their own pace and, particularly, choose and manage their training path.

❖ In a pedagogically open proposal, curricular teaching and course practice addresses the personal, professional and technological diversity among students. It should favour students' interventions and respond by both adapting the technological environment and the contents and curricular strategies to new situations and possibilities offered by the relationship teacher-student-context offers. In the same way, an open curriculum is one that considers adaptations to special situations through level-up situations, alternative assessments, special treatment for students with exceptional circumstances, etc.

❖ Being open from the technological point of view implies overcoming difficulties and problems derived from the technological access situation of students. For example, the possibility of changing synchronic communication for non-synchronic one solves the problems derived from the participation of people with different timetables.

• Interactivity and integration should be a priority in e-learning. ICTs enable communication fluency to take place at least in two directions. An e-learning proposal is interactive and integrating if it takes advantage of these possibilities in order to achieve interaction between those who learn and the collective construction of knowledge. It is interactive and integrating when it considers the social dimension of learning and enables teachers, students and the group to take part in the construction of their own knowledge and learning. As a result, responses should neither extend in time nor be scarce, insufficient or rigid; they should be personalised and immediate. E-learning is interactive and integrating when it enables **dialogue** to take place between students and teachers, peer students, teachers and students and peer teachers and when each intervention gives an answer according to its characteristics. In this sense, learning communities are one of the resources that are more mobilised nowadays.

• Promoting participation and collaboration should be an indicator of achievement of the integrated three-dimensional approach. Participation is favoured when spaces and instances are created to gather and consider the interests and expectations of participants and there is a reaction to their suggestions and needs. Collaboration is encouraged when the joint creation and construction of knowledge, discussion and exchange of ideas are promoted. It is also favoured when tuition reaffirms the common elements or factors and regards individualities as an emphasis and specific strategies as an expression of relevance.

• E-learning should have training resources accessible online, that is, it should display teaching manuals, consultation material, practice material, exercises, virtual libraries, links to Web sites, etc. Additionally, access should not be limited to connectivity.

• Evolution should be integrated in the teaching-learning process. To do so, it is necessary to propose different modalities and instances and include dialogue and feedback in the process. In this line, self-assessment and training assessment play a key role. Assessment is integrated in the training process when processes are as much valued as learning outcomes and when there are instruments to gather students' opinion about personal expectations, degree of satisfaction, etc.

• E-learning should be innovating and should, therefore, incorporate new resources and methodologies to solve problems, improve learning and fulfil the learning objectives set.

• An e-learning proposal should be transparent, that is, its technological aspect should interfere as less as possible, or, ideally, should not interfere at all, with the teaching-learning process. The vocabulary and the

organisation of ICT resources can neither be a confusion factor nor a hurdle to learning. This is a defining feature, not only of virtual and distance training but also of digital technology as a whole when it is used within a training context. In sum, incorporating ICT in the educational process will be transparent to the extent where it accompanies teaching objectives and, at the same time, remains unnoticed.

Other dimensions could still be added; we have already said that this was an incomplete reference list. We are also aware of the fact, though, that it can also be a quite overwhelming list, particularly for those who are just beginning to approach these issues. However, as it will be shown in the next chapter, there are approximations and questions related to all these "duties" in the e-learning scenario of Latin American training institutions. Some of them have already been fulfilled and many more have been solved in practice without previously having filled the category of problem. Maybe this is the most valuable contribution of this comparison list: the satisfaction of ticking items, whether because we have already done it and we had not realised how or because other institutions have solved it and we do not need to start from scratch. And when it comes to a matter pending, it is surely better to share the challenge and so multiply motivation and strengths.

CHAPTER 3
Progress in the application of ICTs

Members should identify human resources development,
education, training and lifelong learning policies which:
...promote and sustain public and private investment in the infrastructure needed
for the use of information and communication technology in education and training,
as well as in the training of teachers and trainers, using local, national
and international collaborative networks...
Art. 3e. ILO Recommendation 195

From the conceptual and reference framework of previous chapters, we will focus on the analysis of e-learning, as defined in Chapter 1. We will address the conceptual evolution it has been undergoing. The means and techniques used to provide training, e-learning goals and institutional management required to move in the right direction are some of the issues that are discussed below. For each one of them, changes in models and practices will be described regarding the effective use of ICTs in vocational and technical training and the strengthening of human capital demanded by the digital age.

The analysis will be carried out in two scenarios of action that, even though totally supplementary, have been developing with certain independence, and while it would be convenient to reach their full integration, they may also be autonomous offers, matching the profile and objectives prioritized by the institutions that carry them out. These scenarios are distance vocational and technical training and career guidance. In both cases, the action of Cinterfor member institutions has been really significant in the last few years.

DISTANCE LEARNING: INDIVIDUAL TRAINING VS. COMMUNITY-BASED LEARNING?

At the end of the 90s, e-learning was presented as a close panacea for educational institutions. Quite effortlessly, big corporations had integrated this kind of systems reducing their on-the-job training costs. The most important universities worldwide rushed into starting this kind of programmes or joined other institutions in consortia to provide e-learning with their name as support.

The promises of the new method were many. First of all, a significant reduction in costs of teaching staff, considering that the same number of professionals would be able to address a larger number of students than in face-to-face instruction or, simply considering that the leading role would be reduced by the self-assessment of courses. Likewise, a significant reduction in costs of premises was envisaged. The new method included a sort of "new" pedagogy that seemed to be inherent and also enabled the development of learning adjusted to students' needs.

In this e-learning marketing, half-truths and half-lies can be identified. The potential of interactive teaching materials, simulators and automated assessment systems was validated from the possibility of technologically building them, avoiding discussions regarding the financial possibilities and material abilities to create them, the educational requirements of technical equipments or the willingness of students to be trained like that.

Even though they promoted a learning methodology that, in theory, placed students in the centre of the process, initiatives seemed to place materials in the centre, thus removing teachers from such place.

Many, if not all, of the initiatives of that time collapsed or mutated into "blended" modalities. This means that the individual learning model, almost without teaching support and focused on materials, mutated into methods where at least the tutor played a leading role, attendance became a frequent requirement and working in contact with students and tutors became necessary.

Most Cinterfor member vocational training institutions started the incorporation of e-learning and "blended learning" to their offer in a planned way, during the first five years of this decade. The fact that it had not been done before would be explained by several factors, such as the low connectivity available in the countries, the low digital literacy of students and, sometimes, of teachers and technicians, but also because they chose to soundly distance themselves from proposals that seem more like magical solutions than real ones.

During this period, the technical/educational abilities of institutions played a fundamental role in analysing in context and in a critical way the offer of "all included" solutions. Just in 5 or 6 years, reality showed that precaution was worth it.

We arrive then to the middle of this decade with a less magical perspective of e-learning and distance training, being quite clear that the use of technology may and should be associated to bring participants of the training process closer, not further apart.

In traditional e-learning, physical distance was increased by the misuse or restricted use of technological means that could provide closeness and a sense of belonging to the educational process in which students participate.

Institutions are increasingly using means to provide information and interact. The Web, e-mail, chat, videoconferences, discussion forums, course logbooks, shared-work folders and in some cases even printed material are integrated into the same training process with the idea of becoming a reference of belonging to the distance training process.

Modern vocational training promotes the development of individuals capable of self-managing the learning process, choosing courses and contents according to their needs and context, and being able to distinguish between a good training offer from a bad one. This is a large and complex task in itself and requires a lot of support and follow-up from the beginning.

In this sense, the idea of students on their own is counterproductive since in an isolated context students will not be able to overcome their limitations in this field, limitations caused by educational systems that have not promoted learning, but teaching.

Traditional models of virtual education used this idea of individual learning on your own time as an appeal, something that ended up being counterproductive for those students and institutions that promoted it.

Individual learning should not be mistaken for self-managed learning.

Institutions were pleased to receive the educational discussion that e-learning entailed, so much so that this discussion resulted in the most innovative teaching techniques (webquests, e-portfolios, collaborative work development, problem and project-based learning, etc.). Obviously, it is not possible to progress on them without providing new training and support to teacher and curriculum development teams.

Nowadays, none of the VTIs within the region considers distance training from a technological perspective; actions are developed from a pedagogical perspective in the first place, looking for ICT tools afterwards in order to make the chosen methodology effective, most times looking for the higher interaction possible and minimising distances.

For instance, in 2004 SENAC developed a postgraduate specialisation for distance learning initially oriented to its own instructors, performing at the same time an ICT skills census for them. At the end of 2006, INTECAP completely redefined its DL working methodology, aiming at providing more support and closeness to students, thus achieving a significant reduction of dropout rates. The same happened at SENAI of Santa Catarina, which developed a methodology which enabled to reduce by two thirds the time to prepare courses and used spare resources to provide proximity and tuition.

Other examples can be found at SENA or INA, where the investment on the development of teaching materials is relevant, not only to provide quality contents but also to impart knowledge on a cultural context, thus providing more proximity between the student and the material. The implementation of project works and collaborative development is another area where VTIs have shown to have internalized the need of training within a context and within the community.

The objective will be then to develop courses with materials adapted to the students' requirements. Tutors will have to carry out a close follow-up of the specific situation of each student and the methodological and curricular design will allow teachers to consider the particular features of their students and the context in which training is provided. In short, current courses indeed place students in the centre, considering them the leading actors of the training process and promoting interaction with their socio-economic environment, with their "classmates" and the institution itself, in order to achieve their learning objectives and, particularly, their labour insertion goals.

That is how e-learning gradually stops being individual and starts to be developed in community.

CAREER GUIDANCE: FROM THE SUPPORT FUNCTION TO A COMPONENT OF THE TRAINING AND LABOUR INSERTION PROCESS.

The extension and redefinition of Career Guidance (CG) and of Employment Services is one of the most significant impacts of ICT-based training. Even though the appeal to vocational training has a long tradition in the field of human resources training, it has been essentially considered as an additional service, independent from the training process and limited to providing accurate information on specialties and training and learning courses, as well as basic tools for looking for a job. In the new employment and training paradigm, guidance provides essential support for identifying and developing abilities and skills of individuals so that they can be informed on the demands and potential of the labour market, reflect on their own skills and limitations and how these may turn into strengths or weaknesses to increase employability. Therefore, it becomes an essential component of the teaching-learning process, responsible for strengthening people as active individuals, capable of designing and managing their own training and career project and, through such means, capable of responding to the current employment reality with more success possibilities.

As stated in ILO Recommendation 195, CG should be provided throughout an individual's life and, among other contents, it should *"provide information and guidance on entrepreneurship, promote entrepreneurial skills, and raise awareness among educators and trainers of the important role of enterprises, among others, in creating growth and decent jobs"* (item d); "promote and facilitate the use of information and communication technology" (item b), which, as we have already seen, the Recommendation considers a part of the basic compulsory education.

But in order to play this new role, CG needed inputs from an information system on the demand and on trends in terms of employment, technology, local development, etc. And, undoubtedly, this has been possible due to ICTs' great potential to relate and exchange information. By way of example:

- offer of courses with occupational profiles with higher requirements from the market;

- demand of workers with training graduates;

- trends and potentials of local development with the development of products or implementation of services by people individually or associated in micro and small enterprises, cooperatives, etc.

Besides, through ICTs, it has been possible to implement distance guidance methodologies in order to encourage people to develop mainstreaming competencies of employability and citizenship; guide them in the design and management of their professional career; allow them to access updated information on the training offer and on the answers training provides for the various requirements of personal, specialisation and updating competencies, etc.

In the last decade, Ministries of Labour and vocational training institutions in the region have been incorporating the offer of CG in a sustainable way through ICTs. It is a process in progress that responds to incremental logic and has various degrees of maturity both regarding the internal aspects of the specific services provided and the systemic configuration. We are gradually advancing towards the conception of Labour Guidance not only as a stage of information before the vocational choice but also as a tool to provide competencies and resources to people so that they can manage their labour schedule in a better and more autonomous way, increase their insertion opportunities or improve their professional situation.

To do so, different services are coordinated and interrelated: *Training Offer; Labour Demand; Labour Intermediation, Guidance itself or Training Support* thus reaching the implementation of a full *Virtual Employment Service.*

Clear evidence of this evolution can be obtained by browsing institutional Web pages. Some clear examples of services that are being implemented by institutions in the region through the use of ICTs are presented below. They are introduced on the understanding that within each subcomponent as well as among them, a cumulative criterion has been followed, meaning that those who have an *Observatory* also include *Articles* and those who offer *Guidance/training support* also have *Intermediation* and information on *Supply and Demand* etc.

1) **Training offer**

   - *Dissemination of courses by specialties and levels, scholarships, other services.* Peru: SENATI; Uruguay: UTU; Venezuela: INCE.

   - *Information on occupational profiles, graduation competencies, curricular nets, related families, insertion characteristics:* Argentina: INET; Bolivia: INFOCAL; Brazil: SENAI, SENAC.

2) **Labour demand**

   - *Articles, documents, research, links:* Chile: SENCE; Mexico: STPS; Honduras: INFOP.

   - *Observatory of the labour market:* El Salvador: INSAFORP.

3) **Labour Intermediation**

   - *Job bank:* Guatemala: INTECAP; Nicaragua: INATEC.

   - *Specific service offices:* Argentina: MTESS; Chile: SENCE.

4) **Guidance/training support**

   - *Support materials for job searches, self-employment and the development of business activities:* Colombia: SENA*;* Peru: SENATI.

5) **System of labour information, guidance and intermediation**

   - *Conceptualization, methodologies and tools for the design and management of guidance and training policies:* Cinterfor/ILO – Gender, training and work.

   - *Electronic and/or self-managed services:* Costa Rica: INA; Jamaica: HEART TRUST/NTA; Uruguay: MTSS –DINAE.

6) **Virtual and integrated employment services related to vocational training options, access to business promotion and career guidance services.**

   - *Network of Employment Services of the Ministry of Labour of Argentina; National Job Bank of Chile, Public Employment Service of SENA of Colombia.*

CHAPTER 4

Some institutional e-learning experiences

The following are some institutional experiences which do not include, of course, all the range of enriching activities that have been carried out in the region. These are illustrative examples and may well provide feedback, enhanced by the strength and richness of practical experiences, to a comparison list of dimensions and possible indicators so as to continuously improve quality, relevance and equity. Therefore, these experiences not only describe in detail the strengths and possibilities but are also a fundamental contribution to a joint pathway. They have been structured thanks to the contribution of professionals of the institutions mentioned who, openly and generously, share this information with the training community of the region.

- **SENAC'S DISTANCE LEARNING NETWORK**

SENAC's distance learning experience commenced in 1947, at the time the modality was held in an outstanding position in the institution, as a means capable of increasing and democratising vocational education opportunities. During this time, a set of initiatives were developed such as "Universidade do Ar" (University on air), which offered commercial courses through the radio. In 1950, this modality reached up to 80,000 students in 318 different towns and it became a significant experience for the history of distance learning (DL) in Brazil. Besides, in 1976, the National Tele-educational System was created and it basically operated through mail, with some radio and television experiences. These initiatives continued and in the 90s, distance learning developments began to be decentralised towards regional units. In 1995, the National Centre of Distance Learning (CEAD) was created and it was exclusively devoted to DL which, apart from producing distance courses open to the population, developed training projects for SENAC's team of experts.

The National Teleconference Network was created in 2000 and it offered real-time interaction opportunities by e-mail, fax and telephone. The Network also proved its capability to serve the population belonging to all the different regions of the country. Therefore, in 2002, SENAC and SESC entered into an agreement that expanded the capacity of the network which nowadays serves more than 400 reception points in all the country.

In 2003, SENAC obtained a licence from the Ministry of Education of Brazil to offer general postgraduate courses (latu-senso) and in 2004, a plan called "Diretrizes para Implantação dos Cursos de Especialização da Rede EAD Senac" was drawn up by all the involved agents.

Nowadays, some of the main programmes are Sintonía SENAC on the radio, the Sesc-Senac Teleconference Programme and several open and distance courses on practically all SENAC's training areas.

Although Regional Divisions had been collaborating among themselves for a long time, they did not have a shared management network of responsibilities, therefore SENAC created the DL Network. The management model developed for this Network is based upon four supplementary and interdependent dimensions: administrative, educational, technological and political areas.

With respect to the administrative area, mechanisms were defined to facilitate a free flow of information and to guarantee that internal processes are properly recorded. Regarding the educational area, clear guidelines were established about the choice of contents, methodological decisions and the selection of assessment procedures, while every regional division was in charge of hiring and managing tutors. The technological support that was created involved not only library management but also radio and television broadcasting or the use of CD-ROMs. Besides, an LMS support was installed for all regional divisions. However, none of these dimensions would be successful was it not for a careful policy management. The network will only be reinforced as long as all the actors involved consider themselves benefited from it and co-authors of it.

In 2005, during the first year of the Network, 15 Regional Units accepted the offer of the two first courses and obtained satisfactory results: 44 groups, 1,407 registered students: 1,103 of which actually attended and 304 were cancelled (22 percent of total registered students), 75 percent of students achieved a 7.0 or higher performance, the tutorial team was composed of 68 percent of teachers, 15 percent of doctors and 17 percent of experts.

In 2006, SENAC DL Network offered updated and expanded versions of the first two courses and a new one: Educational Management. The profile of the people taking these courses can be described as: mainly women, between 30 and 54 years old, married, who have a small family and play a fundamental role in their economic support, who hold an educational expertise diploma and who have a job.

Figure 1. Webpage of SENAC's Distance Learning Centre. www.senac.br/centroesp_ead/index.asp

The relevance of this model is evidenced after having kept 15 participating Regional Divisions in 2005 and three else that joined later. This enables the Network to serve more regions which are sometimes neglected and where the population hardly ever has access to postgraduate courses. There is a team of teachers and coordinators with the profile required by the Ministry of Education and Culture in every state where Regional divisions have chosen to be part of the Network.

• SENAI'S DISTANCE LEARNING NETWORK, BRAZIL

Created three years ago, in May 2004, SENAI's Distance learning network (www.senai.br/ead) gathers all the courses and education services offered by the SENAI System – National Industrial Training Service – to the Brazilian industry.

Fully prepared and already operating, 200 hundred distance learning courses cover more than 20 industrial technological areas, such as information technology, work safety management, paper and cellulose, automation, textile and garment, environment, metal-mechanic, chemistry, telecommunications, automobile, food and beverage, etc. Most of these courses provide initial and continuing training (vocational qualification and development); nonetheless, there are also technical and higher level courses. The national-scope credentials obtained by the Ministry of Education in 2005 for the supply of general (latu senso) postgraduate distance learning

courses have enabled MBAs to be offered to enterprises located in different units inside the federation. Some face-to-face technological degrees also have up to a 20 per cent of their course load in distance modality, according to the regulations of Brazilian educational legislation.

Depending on the profile of the target public and the learning objectives of each distance course, the teaching material selected will contain digital videos, animations and simulations, Web pages, audio materials, print materials or digital multimedia. Taking these same variables into account, several communication tools will be made available, such as the e-mail, telephone, fax, letters, FAQs, online forums, chat, etc. Based on the multiple possibilities they offer, videoconferencing, Web conferencing and virtual learning environment are used to enable the access to classrooms and content and to favour interaction with tutors, monitors and lecturers as well as among students. In every case, the student receives a combination of learning resources and interaction means particularly adapted to his needs, thus guaranteeing the effectiveness of the training process.

Innovating and promising communication and information technologies are monitored by teams who specialise in the development of distance learning solutions. This is the case of digital television, which, in agreement with the Brazilian government's schedule, will begin to broadcast in December 2007. SENAI, aware of the demand, included a line of resource allocation for the development of solutions related to this technology within the list of strategic projects of the System, thus showing consistency in the promotion of innovation.

The inclusion of people with special needs has been taken into account by a number of organisations worldwide. In 2005, SENAI designed a project that was approved by public call for tenders and promoted by the Ministry of Science and Technology. It offers financial support to research and development in the field of assistive technology[1]. The vocational qualification course in the area of information technology for the hearing-challenged developed an educational solution that has already become a methodological reference of the application of ICTs for social inclusion.

Many enterprises request adapted solutions, non-existing courses or specific services of distance learning. To cater for these demands of content hosting in e-learning platforms, digital material production (texts, Web sites, videos, voice-overs, animations, simulations, software, etc.), training of tutors, mediators and experts in content or integral development of distance learning programmes, there are ten specialised teams located in several points across the country.

Additionally to offering distance learning for it's clients, SENAI develops and runs distance courses to ensure continuing training and updating of its own professionals. It is the case of the pedagogical training course – higher level training envisaged for tutors of technical courses -, which has just formed its second group with five hundred participants. During the 2005-2006 period, technological updating in the metal-mechanic, electric / electronic and civil construction areas was made possible thanks to the use of distance learning, which reached three thousand teachers. In 2007, new contents in the metal-mechanic and food and beverage areas will be offered to teachers through distance courses developed by the institution itself. With a group in 2006 and another one in 2007, more than two thousand SENAI professionals who render technical and technological services to enterprises will be taking part in an online training course combined with face-to-face workshops.

Much of distance training has been offered by preparing technicians and teachers to include innovations in their teaching practice. It is the case of distance courses related to competency-based vocational training, teaching resources design, tutor and mediator training and people with special needs. In this area, two SENAI distance learning courses were awarded the Brazil E-Learning Prize in 2005 and 2007.

All these courses used a virtual learning environment and SENAI was responsible for their pedagogical design, teaching resources preparation, content production, Web maintenance, tutoring and monitoring and final certification.

SENAI teachers have exclusive access to online systems which allow them to share resources and coordinate educational actions throughout the country. More than one thousand five hundred curricula of all modalities and areas of vocational training and more than four thousand teaching resources are available on the Internet. In both curriculum and teaching resources databases, browsing, downloading and uploading have become com-

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[1] Assistive technologies are those which enable disabled people to use computers (for example, voice interfaces which read what appears on the screen). These technologies –voice interfaces, screen readers, alternative entry devices, etc.– are not only useful for people with disabilities, but also for people using PCs outside the office.

Figure 2: Web site of the Rede SENAI de Educação a Distância. http://www.senai.br/ead/

mon practices. The teaching resources database enables more than one thousand seven hundred teachers to access articles, apostilles, software, books' and academic papers' summaries, presentations, videos, activities, exercises and illustrations, all of which specify their target public. A compilation of laws and regulations concerning all educational levels and modalities in Brazil together with allied international provisions (a total of more than ninety items) are available for on-line consultation.

This is a brief overview of the use of ICTs in the vocational training actions developed by SENAI during the last two years.

- **PROMOTING THE USE OF ICTS IN TRAINING, SENCE'S ROLE IN CHILE**

SENCE plays a wide and varied role in the promotion of higher use of ICTs for vocational training.

The following are some of the different activities developed by SENCE: e-learning courses offer, active participation in the national digital literacy campaign and introduction of ICT competencies to SMEs.

E-learning

SENCE defines e-learning as distance training through IT systems that enables to accommodate learning times according to the availability and requirements of every person.

The wide range of SENCE's e-learning courses offer includes subjects such as customers' service, sales and hotel industry, quality standards for auditors, trade, e-citizens, production techniques of the salmon industry or health management of fish and even topics that are supplemented by the digital government agenda such as citizens' training in the use of the Internet to foster their relationship with the Government, called "electronic citizenship: save time by following procedures through the Internet" and training addressed to SMEs on the importance of ICTs to browse and be benefited from public contracting sites such as "Chile buys".

A very useful product is the e-learning good practices developed by SENCE which is available on the Internet (www.sence.cl) for institutions offering electronic training services hired by the Institution.

Figure 3. ICT Website of SENCE

Infomóvil and Infocentro

In order to promote the access to its training and digital literacy programmes, SENCE is deploying strategies to reach remote communities where there is a strong demand of digital literacy and access to e-learning programmes.

The first one is a set of mobile classrooms connected to the network called "Infomóvil". SENCE defines it as a mobile classroom space with full bandwidth Internet connection using two-year-old or newer equipment.

Besides, a fixed network is also planned through "Infocentros", which, according to a basic criterion similar to Infomóvil's connection, guarantees that each participant has a computer for practice and access to the network.

National Digital Literacy Campaign

This area, part of Chile's Digital Agenda, acknowledges digital literacy as a fundamental lesson to live in the 21st Century and as a double-sided competency that is key both at work and as a citizen. Apart from being a condition to access knowledge and handle coexistence, digital competencies become essential in labour performance.

The approach of this programme is significantly oriented towards digital inclusion within this knowledge society since Chile has committed to become a country free from "digital divide." It has been structured around three core components: the first one, defined as "Solidarity", is focused on poverty alleviation by the inclusion of

poor population and its digital literacy; the second one is continuing individual and collective training, covered at work and as a citizen; the third one is the modernisation core component which generates an impact on labour and enterprise competitiveness by the access to ICTs.

According to this national campaign, SENCE focuses on the labour world oriented to employed and unemployed workers as well as large, SMEs and microenterprises. Today's goal is reaching 1.5 million users and 3.5 millions by 2010 which would mean 55 percent coverage of active population.

SENCE is promoting workers' training on basic competencies for ICT management. Therefore, corporate social responsibility is promoted so that enterprises take part in the "E-Seal" programme, an acknowledgement provided by SENCE to the enterprises that achieve 100 percent of digital literate workers. This seal has already been awarded to well-known private enterprises and several town councils that have offered this literacy programme to their workers.

In this sense, any interested enterprise may enter into an agreement with SENCE and use tax rebate funds that enables the enterprise to deduct training costs from their tax payments up to 1 percent of the total payroll rate. SENCE assists any interested enterprises to develop this process by carrying out an initial survey on the digital literacy needs that determines workers' PC and Internet operating level and, according to this, draws up a training plan that becomes the key component of the project which will then be implemented and assessed.

ICT competencies for SMEs

An electronic-based training programme of basic ICT competencies has been created as a support and assistance training programme for SMEs. These basic ICT-management competencies include introduction to PC operation, word processors, spreadsheets, presentations, Internet as a new space for enterprise management and communication.

• LEARNING ENVIRONMENT TRANSFORMATIONS AT SENA, COLOMBIA

To SENA, it is becoming more necessary to articulate three main aspects of training for work: the quality of our response, the relevance of such response within the regional, national and international environment and equity, an instrument of socioeconomic dialogue for the country.

The institution's priority is to support massification processes, the use and productive application of ICTs in the country, and thus contribute to the compliance with the objectives set in Plan 2019 and the commitments taken on by the country in the World Summit on the Information Society which will enable to reduce the digital divide, contribute to improve life standards of Colombian population and increase competitiveness in the productive sector and national technological development.

Vocational training offered by SENA is one of the main components of human capital development which encourages building up a knowledge-based society that fosters development, innovation, competitiveness and high productivity.

Along these lines, SENA's graduate profile is sought to be oriented to a broad development of free thinking, with critical awareness, and to be constructive, respectful and supportive, which means being involved in society's welfare, and be leaders of their community and skilled to become entrepreneurs.

As a consequence, SENA has identified four knowledge and change sources: changes in the trainer's role; collaborative and team-work learning environments; the environment, that means activities associated to the labour world; and, finally, information and communication technologies that involve the Internet, information systems and network management of training contents.

Today, learning environments are much more diverse than traditional classrooms and workshops. At the same time, the trainer is no longer the only formal knowledge source; his role becomes much more significant as he facilitates the student's knowledge management. Information and communication technologies – ICTs – have brought about changes in the educational paradigms and in the tools and means for the transmission of knowledge.

Upon the institutionalisation of the four areas, each Training Centre manages the educational process in such a way that it facilitates to the student an adequate percentage of working hours with the trainer and an appropriate percentage of collaborative working hours on educational projects associated to the environment, thus guaranteeing the access to virtual environments to promote learning management.

It is clear that ICT also improve teachers' work and educational administration since the teacher can concentrate on high quality education, answer questions to learners, become a real tutor and trainer instead of being in charge of the transmission of knowledge as this is provided by the contents on the Internet. Therefore, tutors are in charge of following up learners' knowledge construction and application.

In order to achieve this, it has been necessary to transform the implementation model of the ICT infrastructure of the institution by strengthening the telecommunication services, from an acquisition model of connectivity equipment to an integral provision of telecommunication services for all SENA users. SENA thus invested an important portion of its budget to guarantee, to each learner and trainer, access to the knowledge society with easiness and flexibility according to its mission. This innovative model of hiring services offers special advantages to SENA such as a decrease in administrative wear due to processes of annual hiring, a reduction in costs thanks to lower installation, implementation, migration and stabilisation service costs. Furthermore, it will lead to an improvement in the quality of services so that the institution can comply with its mission in a more efficient way. With this great effort, SENA hopes to integrate more than 4.5 million Colombians into the knowledge society, thus responding to the National Government policy to narrow the digital divide and strengthen the public offer of training for work, obtain results in terms of equity, the bitter fight against poverty and the increase in competitiveness and productivity of workers and enterprises of the country.

SENA's Virtual Training

SENA has implemented infrastructure, human talent and technological culture to be part of the group of national and international institutions that are convinced that virtual training is a gate not only to global communication but also to knowledge access.

This strategy has enabled SENA to offer around 1,000,000 training places between 2003 and 2006, 6,500 of which are Colombians who access from 95 different countries. The rest are Colombians who have accessed from 1,045 of a total of the 1,098 existing city councils in the country. This year, SENA intends to offer 1,200,000 training places at virtual environments. Today, June 7, 540,000 students have registered in more than 400 supplementary training programmes through the Web site www.senavirtual.edu.co that includes more than 28 different specialties and economic sectors. There are continuous offerings that can be seen at the Web page.

As a great effort to reduce the digital divide, SENA has entered into agreements with public sector institutions to offer Internet access to the population of 637 of the most remote town councils of the country. In this way, the student accesses a tele-centre of his community and develops a learning process in his area of interest.

Furthermore, a digital certification process has been implemented for students using learning environments. It has been used since 2005 and it facilitates on-line certification to learners when approving the activities of the corresponding training module. The system also enables employers and interested people to validate at any time the authenticity of the issued certificates.

According to the beliefs of the IT and Educational Technology Group of SENA – an organisation depending on the Vocational Training Board, that together with 2,500 tutors of Vocational Training Institutions in all the country is responsible for generating ICT-based training for Colombians – there are five essential conditions for any learner to be successful in his virtual training process: 1) develop team work skills; 2) have a strong desire to be responsible for his own training; 3) have discipline to self-manage knowledge; 4) develop IT competencies that allow him to browse through the cyberspace as he makes progress in his learning process; and 5) be hardworking and determined to work in a network.

According to the strategy of virtual training, SENA facilitates educational environments so that workers and unemployed people can supplement their competencies associated to their professional profile. It aims at the employability of Colombians and it is oriented to offer them a relevant answer to the updating and expertise needs of the staff of organisations, both SMEs and big enterprises.

Some agreements with technology suppliers such as Microsoft have enabled to assist training process of 1,200 SMEs by virtual means, including videoconferencing. As regards big enterprises, there are several degrees and training 'tailor-made' to enterprises.

TV and Web-based training

Training guided through virtual learning environments is integrated with more traditional means of distance training. For almost two years, television and the Internet have become one means to provide training for work to thousands of Colombians: contents including real cases are transmitted through the television and learning activities are developed through the Internet.

16,920 training places have been offered in 17 programmes organised according to this strategy. Training through this modality goes from building of one- and two-storey earthquake-resistant homes as well to confectionery and ISO 9000:2000 Quality Management Standard.

Figure 4: SENA virtual

The new approach to vocational training

The learner-centred educational process necessarily involves a different training process management. It must enable people to get involved in the effective and productive use of learning in specific situations and projects.

In this way, we are committed to integrate basic, mainstream and specific competencies of the Certified Training Programmes of SENA on productive projects, using information and communication technologies and Virtual Learning Environments for learning process management, increasing trainers' competencies for a flexible implementation of curricula, and applying project-based training strategies supported by other active teaching techniques.

With respect to curriculum design, the minimum unit is the competency unit and the training module, thus making the building up of training programmes more flexible. The selection of learners is carried out by privileging the ASSESSMENT of the POTENTIAL aspects of applicants with instruments that enable to evidence general

competencies in logics, aesthetics, efficiency, quality, determination, leadership, patience, all of them related to the learner's programme of interest.

The transformation process of Training Centres has been reflected in:

1. **Specialisation of Training Centres around core, critical and supplementary technologies,** which enables SENA as a unit to assist learners and entrepreneurs to make Training Centres specialised on core technologies at the service of other centres as critical and supplementary technologies. It therefore guarantees collaboration among centres which will share infrastructures that permit resource optimisation.

2. **Trainers** work as a team to guarantee that the training process covers specific or production and service solutions, upon which learners may develop competencies related to training modules. The trainer takes a teaching and methodological step when making other learning sources available to learners.

3. **Learning environments.** These environments become flexible, open and have the characteristic of enabling continuous access to trainers and learners. They make collaborative and team work possible, and the technologies integrated around a productive process are considered their core component.

Other Innovative Learning Environments

Global Classroom

Global Classroom interconnects SENA's Training Centres by implementing an automated flexible manufacturing cell with six state-of-the-art working stations. The learning process is guided by the Global Classroom. Learners are connected in real time from 10 Training Centres located in different places of the country. Learners get into the cell by browsing from their classrooms. The technology used there allows learners to interact with all working stations and to monitor, by means of three robotised cameras, the implementation of their automated manufacturing cells.

Blended learning or combined training

Blackboard is a Learning Management System (LMS). This platform allows on-line communication between the trainer and the learner, and among learners. It also enables to create groups of collaborative work, it facilitates knowledge management, and it offers a follow-up of learners and trainers with the corresponding record of each classroom-based activity.

SENA is currently using Blackboard to develop on-line courses or the so-called virtual training. However, it is also used in the management of face-to-face training. For this purpose, all curriculum structures have been digitalised in an educational way to be managed on-line by trainers, academic coordinators and learners.

In this way, learning units become dynamic and a knowledge database is created, which will be enriched by all trainers and learners.

Computer-assisted trainers and trainers for remote training

Training teams of learners are mostly built up at SENA and by learners themselves. This occurs when applying the project-based training strategy in which students themselves design and build up solutions to productive needs. These teams developed by learners become training tools for learners through *virtual* environments. They facilitate the access to remote trainers that optimise investment by combining information and communication technologies with data acquisition of physical phenomena associated to productive processes. SENA has a farm with remote servers that enable real-time access from any part of the country or the world.

- **INA'S UTEFOR, COSTA RICA**

INA's Training Technology Unit was created by the Board of Directors on November 26, 2001, it was approved on May 20, 2002 and it began to operate in the year 2004.

UTEFOR is the unit in charge of promoting and facilitating a teaching model for INA (National Training Agency) based on virtual environments and other information and communication technology tools. The Virtual Training initiative is part of the Strategic Plan on Information Technologies which is currently being developed by the institution.

Figure 5. UTEFOR Web site

UTEFOR promotes the advance of a digital culture for everyone. In addition, it develops trainers' necessary competencies, so that they may cater for training in technology but also for all aspects related to the educational use of technology.

From 2004 to 2006, nearly six thousand people have graduated with the blended learning modality and around 20 enterprises have been provided with training using the corporate modality certified by INA. In many of these enterprises, training is provided as continuing education; as a result, training is extended all year long.

UTEFOR has created 35 modules to be taught in this modality, 25 of which are already being offered on the Internet as distance learning. Another 11 modules are under development.

These modules are offered in one of the following four modalities that have different educational and methodological designs. Modules are taught through:

1. A virtual campus and an INA's teacher.

2. A CD ROM in an INA's Laboratory and with an INA's teacher.

3. A CD ROM in an enterprise laboratory and an enterprise's teacher.

4. A CD ROM that the student takes home; and then he attends tutorials.

Training modules for all 12 training areas (nucleus) of INA have been developed. UTEFOR has also designed virtual training courses particularly earmarked to SMEs.

UTEFOR has set up Dokeos as its LMS. Dokeos has been translated into 34 languages and it is currently being used by more than 1,000 organisations worldwide to manage their training and collaboration actions.

Many of the courses taught under these four modalities are experiences that have already been tested in face-to-face training. UTEFOR has defined some guidelines to adjust these courses to virtual training. Briefly, the steps followed are:

1. Analysing the educational, technical and background profile of the participant to be developed in the Virtual Training Modality.

2. Laying down the technical criteria Executive Units must fulfill in terms of infrastructure and necessary IT equipment in order to provide vocational training services through Virtual Training.

3. Identifying the teaching methodological strategy according to the virtual environment selected for the vocational training services.

4. Making the appropriate methodological adjustments to adapt a face-to-face Vocational Training Module to the Virtual Training Modality.

5. Establishing the corresponding roles of Training Centres, Regional Units and UTEFOR according to the Virtual Training Modality.

As a means to give continuity to this process, INA has launched an ICT-based training programme for trainers. It has trained more than 300 teachers in areas related to the application of information and communication technologies in teaching practice developed in virtual environments and in the design of teaching material.

Simultaneously, technological literacy is being spread not only among teachers but also among the administrative personnel, as a means of improving productivity and preparing INA for offering further support to ICT-based training activities.

Within this framework, the second edition of "INA's ICT Meeting" will be taking place this year. The 2006 edition took place in San José and was repeated in two Regional Units.

In this way, INA is preparing itself for catering for a growing demand of virtual training, trained graduates in ICT and face-to-face training with ICT components.

• **DISTANCE LEARNING AT INTECAP, GUATEMALA**

Since 1980, the Technical Institute for Training and Productivity, INTECAP, has been developing distance training actions. As from the year 2005, with the creation of the Department of Technological Development Programmes (PDT), distance training began to be a part of e-learning and, from 2007, all distance courses, except for those in the area of building, are managed on the technological platform.

INTECAP has implemented the use of ICT not only with the purpose of transforming the work methodology as a tool to facilitate administrative processes but also as a means to extend its coverage through e-learning.

The PDT began its activities in February 2005 by renting e-learning platforms to provide training. In 2006, it ran some pilot tests in the IT area and the administrative area.

In November 2006, while analysing the strengths and weaknesses of the e-learning area, and prior to INTECAP's restructuring, it was realised that INTECAP's projects in the ICT area were neither in-focus nor coordinated. There was no area within INTECAP specialised in the subject, there was poor assessment or follow-up of distance programmes and innovation regarding the use of the Internet was scarce.

In January 2007, the PDT managed to form a multidisciplinary working team that helped to improve the development process of digital material, work areas, computing and software equipment used for the production of multimedia material, the administrative system and the IT competency levels of the staff through training.

It developed a short-term work plan that enabled breaking with old paradigms and, by June 2007, the online training offer increased by 300 per cent and the number of people trained monthly rose above 25 per cent remaining stable. Leadership on the project on "Innovation and Coverage Extension of ICT-based Vocational Training of the Vocational Training Network of Institutions of Central America, Panama, Dominican Republic and Haiti" was regained by offering online advisory services on the creation of interactive contents, e-learning, ICT tools, work system, integration and use of contents inside a learning platform to INTECAP's vocational training partner institutions in Honduras, Nicaragua, Dominican Republic and Panama (in the face-to-face modality).

The PDT implemented a marketing and training system linked to the same communication channel www.intecap.org.gt. The system publishes contents in an automatic and personalised way, enabling institutional information to be passed on to cyber visitors. The e-learning system includes a contents management platform for training, linked to a methodology and a specialised working team, in order to offer Internet-based training. The development of a platform to pay for courses and services through the Internet is planned for the future.

The PDT is responsible for providing distance training through e-learning and mobile units. E-learning is addressed to participants in Guatemala but also abroad. There is a strong demand of training for SMEs, which has encouraged the development of modules and courses. Training by mobile units is mainly targeted to vulnerable population or people who have considerable difficulties to access training centres.
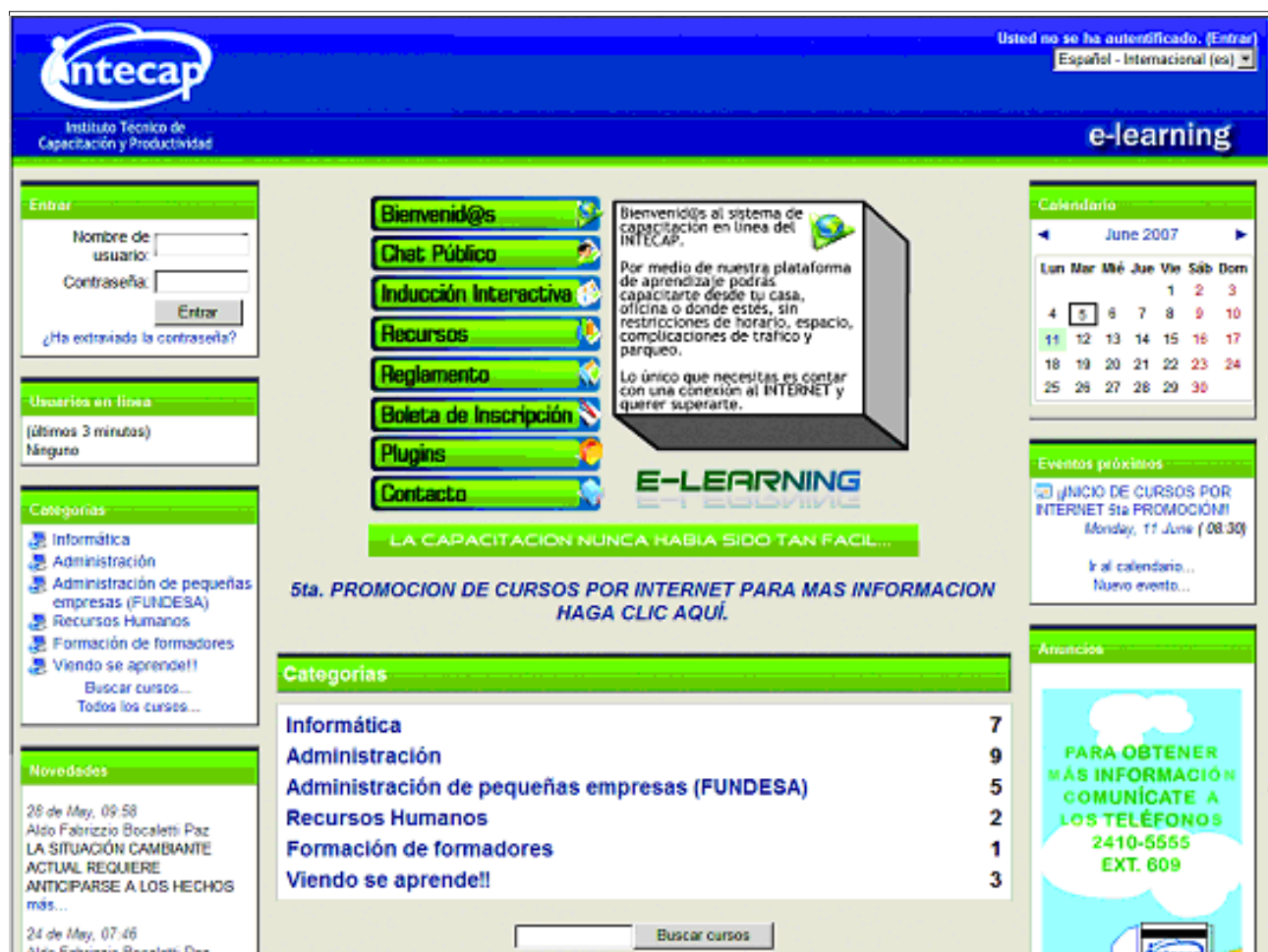

Figure 6. INTECAP e-learning site

INTECAP also offers a distance training line for the building sector by means of the use of television and newspapers. Modules are distributed as supplements in a newspaper, and every 7 days a TV programme is broadcasted dealing with the topics covered by the supplements. In this methodology, students can contact tutors by telephone.

In methodological terms, the PDT develops online courses following a series of six stages:

1. Content development: the expert on the topic designs the course and develops its contents in coordination with the educational expert.

2. Technical and educational revision and adaptation: the course material is brought to this section to be adjusted to the training curriculum.

3. Design and layout: the material is brought to this section to be processed in two ways:

   a. PDF format for the support resource

   b. Web design for the interactive part

4. Module build-up and upload in the platform: the course's contents are divided into modules in order to be uploaded to the platform. During this stage, the Administrator checks the download and the contents management of the whole course, as a participant and as a tutor.

5. Training: the training process of participants is basically divided into three phases:

   • Introduction: induction to the platform, the course and tutorials. Face-to-face or virtual.

   • Development: consultancy, monitoring and follow-up of participants, as well as process assessment. This phase is completely virtual.

   • Conclusion: final virtual assessment.

6. Accreditation: after satisfactorily completing any event, an attendance certificate is issued for them.

In the e-learning methodology, the participant logs into the learning platform with his user name and password. There, the course's contents will be displayed in sequences according to the progress of his training. Such contents include texts, PDF manuals, demonstrations, multimedia animations, interactivity and resources that reinforce learning. The participant receives the support of an assigned tutor who is an expert in the area and gives him advice, clarifies doubts, assesses knowledge and motivates the development of the online event.

E-learning is provided through a Learning Management System (LMS) called Moodle. The content creation process in Moodle has been largely simplified through the use of DreamWeaver or Flash templates.

INTECAP welcomes national and international participants, supporting e-learning through a multi-point video conferencing network that allows conferences to be given in real time, making use of other Internet tools, such as discussion forums, e-mails, chat and online support.

The PDT has eight professionals of varied disciplines; there are five mobile units with 5 instructors assigned and tutors are hired according to courses' demand.

In order to be hired, tutors undergo competency tests in the use of ICTs and they receive training in the use of the platform, the creation of contents and the management of their activity as a distance learning tutor. This special attention on tutors has enabled INTECAP to significantly reduce the drop-out rate in e-learning courses.

Today, INTECAP has 15 online courses and offers training through its mobile units on Agriculture, Animal Health, Information Technology, Food, Electricity, Tourism and Cooking. 1,622 students have already been trained through the e-learning modality while mobile units have provided training for 1,310 since 2005 to this date.

One of INTECAP's projects is to offer Internet-based access to its virtual library, which nowadays is only accessible from inside the institution; another important one is in the area of information and communication technologies and consists in building up the Koika-Intecap ICT Centre, which will provide training in the face-to-face, partial face-to-face and distance modalities to the productive sector in six technological areas, Web Development, Animation, Database Development, Operational Systems, Network and Application Development.

The Government of the Republic of Korea will provide a financial aid of $ 2,500,000 (two million five hundred thousand American Dollars) and INTECAP will invest approximately twice that sum to carry out the project. This will enable Guatemalan human resources to be trained in ICTs in the short term (July 2008), thus contributing to the reduction of the digital divide and improving the accessibility to information and communication technologies in Guatemala. This will favour economic and social development through job generation and income increase, thus strengthening the relationship and ICT cooperation between both countries by the success of this project.

- **HEART TRUST/NTA: ICT EXPERIENCES**

The HEART Trust/NTA is the facilitating and coordinating body for workforce development in Jamaica. We provide access to training, competence assessment and certification to all working age Jamaicans and offer career development and employment facilitation services island-wide. Training is provided both in the workplace (Enterprise-based), as well as through the Vocational Training Development Institute (which is the tertiary arm of HEART Trust/NTA), our 28 formal technical vocational and education training (TVET) academies and centres (institution-based) and over 120 TVET special programmes (community based).

ICT Policy

In 2005, an ICT policy was developed that presents policy guidelines for the development of ICT Integration within HEART Trust/NTA. In order to meet the organization's training objectives, the ICT Policy manual seeks to set the framework for infrastructure, training parameters and ICT integration. In-keeping with this, certain ICT initiatives have been implemented which include but are not limited to the following:-

- ICT Integration Workshops
- The utilization of a Learning Management System
- The expansion of Distance Education Initiatives

ICT Integration Workshops

Each year workshops are conducted with facilitators from HEART institutions in which they are taught how to effectively apply technology to support the learning process and how to develop lesson plans reflective of the same. This includes looking at learning theories and styles and their application to the learning environment. It also includes a familiarization with the accompanying instructional media which can be used to enhance the learning process and designing appropriate and applicable learning activities which should be used in the delivery process.

These workshops target but are not limited to facilitators from within the Trust. Workshops have been conducted that included participants from the High Schools and Teacher's Colleges. In general, ICT Integration workshops are facilitated by two sub-units of the Trust – the Educational Technology Management Unit and the Vocational Training Development Institute.

The Educational Technology Management Unit

The Educational Technology Management Unit is the arm of the Learning Management Services Department that is responsible for coordinating and monitoring the use, integration and evaluation of information and communication technologies (ICTs) in training delivery, in order to transform the teaching and learning environment. This unit is also responsible for the creation of electronic learning resources to be used in the TVET system.

The unit:

- Encourages facilitators to develop lesson plans that reflect the use of ICT integration.
- Assists institutions to develop technology plans that speak to how they will use various technologies to impact teaching and learning.
- Conducts professional development workshops for facilitators/managers in the use of technologies for ICT integration.
- Provides consultancy service to training institutions and other organizations in the development of electronic learning resources/facilities.
- Conducts ICT integration "Clinics" for facilitators in HEART Trust/NTA and teachers in the formal education system. The ICT Clinics have been conducted annually since 2005. At the moment there are plans to have a regional ICT Clinic as we hope to expand ICT integration initiatives regionally.

Expansion of Distance Education Initiatives

The Vocational Training Development Institute (VTDI) is the tertiary arm of the HEART Trust/NTA. In accordance with the VTDI's mandate to increase access to training, the institute offers some of its programmes via a distance modality. To support this approach, an audio-graphic system is used in conjunction with a learning management system.

The Audio-graphic System

Through the use of the audio-graphic system, students at off-site locations are able to hear the voice of their facilitators as well as view any material (such as PowerPoint slides) that are made visible through the use of the smartboards located at the sites.

The Learning Management System

The Learning Management System through the provision of the following features supports the programme offered via distance.

Its features include but are not limited to:

- Maintenance of a student attendance register
- Online chat
- Discussion forums
- Posting of course material
- Surveys
- Report facilities

Workshops and training sessions, in the development of study guides and other instructional material to support the distance modality, are ongoing, as well as workshops that focus on the strategies and techniques that can be effectively employed when using the audio-graphic system. These sessions are coordinated by VTDI's Distance Coordinator with the support and guidance of VTDI's Distance Education Steering Committee.

In March 2006, a position paper on Distance and Open Learning was developed for HEART Trust/NTA. From this, a policy document on Distance and Open Learning was prepared and is now being approved. This policy, as soon as it is passed, will act as a framework for Distance and Open Learning initiatives within the organization.

• **INFOTEP VIRTUAL, DOMINICAN REPUBLIC**

INFOTEP has been working for 13 years in the ICT area of face-to-face instruction. IT labs are used as a resort for face-to-face instruction where IT lessons are offered as a support for virtual and attendance-requiring programmes, drawing up of contents and work with multimedia. Among ICT resources, there are computers, software, multimedia projectors, scanners, TVs, digital cameras and simulators.

Labs have also been used for blended and virtual training in Java programming courses, through Sun Microsystems's training platform, and in an agreement with them and the virtual Dominican University.

Certain that the development of blended learning or e-learning does not begin or end with technological enhancement, INFOTEP has promoted contacts, workshops and seminars with institutions such as SENA from Colombia, INTECAP from Guatemala, INWENT from Germany and CINTERFOR so as to define a conceptual framework for "INFOTEP Virtual" initiative.

Along the same lines, 'INFOTEP Virtual' project has been adjusted to the 'INFOTEP PROACTIVO 2010' strategic plan. The new design of the training offer centres the participant and customers within the training process.

In 2006 already, a research on LMS platforms was carried out to choose the one that better adapted to the identified requirements and the institution plans to enter a development process of labour competency-based courses.

It is essential to adopt a virtual training paradigm that trains teachers and tutors not to apply to distance learning a face-to-face training paradigm since this has proved not to be effective.

Figure 8: Virtual INFOTEP

INFOTEP Virtual started in 2005 with the following activities:

- Contact and exchanges with six experienced institutions (CIDFORT, INTECAP, SENA, CINTERFOR, INWENT and Universidad Virtual.)

- Training 25 experts on IT resources management.

- Training 35 experts and virtual tutors, including labour competency issues.

- Implementing a pilot project of Virtual training that included 5 courses taken by 41 students.

- Developing of contents and virtual training programmes in Strategic areas. These are: Information technology, middle management training, hotel and tourism industry.

INFOTEP has four technological centres and sixty operational centres in the information technology area distributed across the country for administrative cooperation of operations and an operation unit for technical support and contents development. Two of these technological centres are being equipped by videoconferencing systems.

INFOTEP's main challenge is to manage to implement 150 virtual courses in all training areas working with full teaching support, digital educational materials and tutors trained on ICT and labour competencies by 2010. By this date, virtual libraries and teaching resource databases are expected to be available as well.

- **VIRTUAL SENATI PROJECT, PERU**

SENATI (National Service of Occupational Training in Industry) of Peru is currently "on air" and almost finishing the stage of validation of its ICT-based distance learning service.

During the previous months, SENATI provided training to prepare 25 tutors who will specialise in this area. The SENATI system of virtual training consists of an e-learning site, a video conferencing network that connects 14 centres and a virtual library.

The first target audience are teachers for internal training, middle management in enterprises and graduates from basic training.

SENATI regards the incorporation of online training as a component of face-to-face training. The aim is to bolster self-learning competencies while the student attends a course. These would be particularly important values in order for the graduate to benefit from other online training offers and develop the abilities required by the market.

SENATI has chosen Moodle as its Learning Management System. The word Moodle used to be an acronym of *Modular Object-Oriented Dynamic Learning Environment*, which is especially useful to programmers and education theoreticians. It is also a verb that describes the improvisational process of doing things as it occurs to one to do them, an enjoyable tinkering that often leads to insight and creativity. Both entries apply to the way in which Moodle was developed and the way in which a student or a teacher would approach the study or teaching of an online course.

Nowadays, SENATI offers 13 e-learning courses which cover areas that range from teacher training to maintenance management, marketing or ISO standards.

An important challenge for SENATI will be that its staff incorporates the ICT dimension and the institution renders quality ICT-based services. A good example is the development of digital teaching materials. Many of the processes that take place inside machines, engines, electronic circuits, hydraulic circuits, etc. may be better understood with teaching aids and materials that are suitable for each case (videos, animations, pictures, simulators, etc.). One of the key factors to accelerate the learning process is the availability of a variety of ways to present information: people learn in different ways and therefore it is necessary to present contents through varied channels, e.g. text, video, animation, etc.

Figure 9. Virtual SENATI's promotional page.

• CINTERFOR'S EXPERIENCE

Cinterfor/ILO began exploring ICTs in 1998 when the institutional Web site was created as an instrument to comply with its main objective: developing and promoting the identification, exchange and dissemination of updated information, knowledge and experiences that favour the development of vocational training. Since then, there have been constant efforts to strengthen and innovate, and expand its goals. The Web site has consolidated as one of the most complete and updated vocational training site of the region and has become an important reference for the interlocutors of the Centre and several training actors thanks to constant updating of information, inclusion of new subjects, incorporation of an English version and many resources in Portuguese as well as the exploration and application of new tools and technological resources to innovate the design and organisation of information, facilitate and increase access to it.

This political commitment of Cinterfor/ILO to incorporate ICTs has become gradually evident in its actions and is currently expressed not only by the promotion of vocational training in research, analysis and spreading of application experiences but also by the implementation of workshops, seminars, training actions for VTI staff, development of international cooperation projects, etc.

Cinterfor/ILO has gone through a short but intense path, bidding strongly for the Internet and its tools as interaction, exchange and collaboration mechanisms *with and among* the institutions of the regional training system. The results, modality and methodology of these experiences have been very varied and, thus surely, very inspiring in terms of exploration and learning.

Distance activities carried out at Cinterfor

Within the framework of cooperation established together with the National Institute of Youth (INJUVE) of the Ministry of Labour and Social Affairs of Spain, and by the Project on Youth and Training in Latin America, **two regional virtual seminars** were implemented: **"Youth and training for employability: development of key labour competencies"** (Oct 28 to Nov 8, 2002) and **"Assessment of the impact on labour training experiences for young people"** (Oct 9-20, 2002). Both activities included the participation of outstanding experts of the region and enabled the exchange of information and views on issues and experiences in training young people. More than 550 people of 27 countries took part in the activities and more than half of them were active participants[2], thus showing the importance of the dynamics of the event.

Another experience developed by Cinterfor was the implementation of two editions of the distance course "**Cost analysis for vocational training management**". It was a basic course on accountancy for non-experts but for people who are responsible for administrative planning and control of vocational training programmes. From a methodological point of view, it consisted of graded modules with exercises revised and commented by the tutor. Furthermore, it had two forums: one for exchange among participants and another one between them and the tutor.

In November, 2003, Cinterfor/ILO implemented the "**Induction distance seminar about training policies for the improvement of employability and gender equity.**" It was structured according to basic reading texts which fostered discussion in the forum and, to go deeper into the issues, reference materials were suggested as well as the sub-site Gender, Training and Labour. This Seminar was attended by more than 100 people from the planning and execution areas and the training policy management area of VTIs, teachers and labour advisers, teams from the Ministries of Labour and Education, representatives of the entrepreneurial sector and workers' sector; as well as other people related to training for work.

These learned lessons together with the commitment of spreading and promoting the *Training policy model for enhancing employability and gender and social equity* and its toolbox (hereinafter the reference model) developed by training institutions of Argentina, Bolivia, Costa Rica and Cinterfor/ILO through the implementation of Programmes such as Formujer[3] and Proimujer[4], have stimulated and supported the political com-

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[2] Active participant: any person who has been active during the seminar and who has taken part in the discussion, making comments and sending materials, etc.

[3] Regional Programme to strengthen the Vocational and Technical training of low-income women in Latin America Its

mitment to appeal to VTIs to strengthen and innovate the Centre's will to make available to VTIs accrued knowledge and coordinate a space for discussion, exchange and inter-institutional cooperation regarding training policies design and management.

Therefore, thanks to the support of the Suisse Agency for Development and Cooperation (SDE), the first edition of the **Distance Training Programme of Institutional Strengthening for the improvement of Quality and Equality of Training Policies** (hereinafter QEP) started in November, 2004 and ended in July, 2005. Upon consideration of the assessments and lessons learned, the programme was revised and a *second edition* was drawn up to be put into practice in July 2006, and which is planned to be finished by the end of this year. This edition includes a total amount of 360 hours, thus becoming a technical and topical specialisation programme.

QEP's teaching methodology: a contribution to learn how to change and to learn how to teach on how to change

Since the Report of this 38th Technical Meeting also approaches the QEP[5], this paper will focus on the construction process of the proposal and its methodology so that, what has been done, together with the encountered difficulties, may help to reduce the efforts and costs of the collective path.

The assessment of the reference model together with the Centre's experience regarding the management of knowledge sharing and the coordination of regional activities and Cinterfor/ILO's Web site were considered as structuring pillars of the methodology to be developed.

The reference model provides an organising conceptual map of the theoretical approaches and the components that should be adopted by a training policy in order to offer relevant responses to the challenges of the current labour scenario and to contribute to a more sustainable and inclusive social and economic development. In theory, it offers a *new view* that focuses on a comprehensive and systemic approach of the policy; incorporating the gender perspective as a conceptual framework and as an instrument of analysis of social relationships and, thus, of the labour world and vocational training, competency-based training and the strengthening of employability, adoption of teamwork and project-based work as devices to bring about changes. Furthermore, it offers a tool box consisting of methodologies, strategies, curriculum developments, demonstrative experiences, etc. The model is the result of the recovery of institutional knowledge and practices, systematised according to a methodology of collective construction of knowledge based on the adoption of common criteria and flexibility in terms of emphasis and management strategies.

With respect to the Web site, the 'Gender, training and work' sub-site intends to promote its role as a cognitive instrument and foster significant learning. It was redesigned according to a graphic representation of the reference model and with *hypertext* logics. The *Employability, quality, equality and gender* section [6] was created to offer a thorough explanation of the Model and its toolbox, integrating several types of products: print, graphic, electronic, audiovisual material, etc. and with different registers. Furthermore, the subsite offers a direct access to the Information Service of the Centre which offers a great variety of resources and person-

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objective was creating and spreading a general model of methodologies, strategies and tools to improve quality and the incorporation of the gender perspective to training. For more information, please visit:
http://www.cinterfor.org.uy/public/spanish/region/ampro/cinterfor/temas/gender/formujer/index.htm

[4] Promotion Programme of equal opportunities for women in employment and vocational training, Uruguay. MTSS - DINAE/ JUNAE – Cinterfor/ILO. The general objective of the Programme is to contribute to the reinforcement of active employment policies, through the development of skills that favour the access of women to the labour world under conditions of equality. For further information, please visit:
http://www.cinterfor.org.uy/public/spanish/region/ampro/cinterfor/temas/gender/proimuj/index.htm

[5] See Point 1 – Strengthening of training as a means for increasing employment access opportunities and decent work and point 4 - Production of knowledge and spread of information, 2005-2007 Report - XXXVIII Cinterfor's Technical meeting.

[6] Please visit subsite: http://www.cinterfor.org.uy/public/spanish/region/ampro/cinterfor/temas/gender/em_ca_eq/index.htm

alised support to queries. This new design was essential to make ICT an instrument of critical thinking and the Web site became the educational support tool of the QEP.

Considering this approach, the QEP was designed as an initiative oriented to multi-disciplinary teams of institutions envisaged to training for work with the purpose of developing and/or strengthening personal and institutional competencies of design and management of quality and equal training policies. It articulates training services, a materials bank and an observatory of experiences, tutorials and learning community. The *person, the institution and their context* are understood *as main features of the continuous teaching-learning process*, and it is thus defined as a training-action programme: during the whole process, the purpose is that people and the institutional team manage to apply or reflect upon issues and areas of their own vocational and institutional practice.

Training suggested by QEP has a competency-based approach and it therefore starts from the *recovery and assessment of individual paths* (educational history, relationship within personal and family environment, etc.) *and policies and practices of participating institutions* (mission and institutional culture, modality, articulation with the environment and different actors, relationship with the target population of training, etc.) A set of activities is proposed that respond to a double and simultaneous objective of both personalising and experiencing the analysis of situations and issues, and organising teams to play a multiplying and leading role in changes. This is expressed by an ongoing effort to achieve an interaction between the demands of work and the contents provided.

One of the key challenges of QEP is *generating and strengthening institutional teams. This comes from the concern about consistency among theoretical approaches* (systemic approach, gender as a subject located and conditioned by his/her environment but able to transform the initial condition by means of individual and collective strategies) and the inter-learning-sustained teaching methodology. Team work in order to achieve a common objective based on a methodology and sharing ethics is, thus, one of the 'non-negotiable' aspects to participate. Of course, this implies some risks that must be taken into consideration from the beginning such as: difficulties to have moments in common, to come to terms with agreements, different types of work, the need to permanently review what has been planned in order to adapt processes, different degrees of motivation of participants, different reading, reflection and analysis rhythms, among others. All these situations may cause dropouts and /or unhappiness of teams but we have noticed that their benefits in terms of articulation of distance training and face-to-face instruction and the incorporation of both attitudinal and methodological changes highly make up for them.

On the other hand, *project-based work* implies thinking in terms of results and processes and is structured in stages whose results intend to address guidance-questions of the process of change: *where do we start from, what do we want to achieve, how are we going to do it, what have we achieved and what needs to be done.* In the QEP this device has several scopes and involves its actors in many ways.

The policy model has this Occupational Project (PO) as its "convergence point" because it is understood that employability, quality and equity of training will be improved by the support to people in order to define and manage a viable training and working project. From the perspective of curricular planning, PO is the articulating core component of the teaching-learning process and a strategy to make training more personalised and flexible. Furthermore, supporting and promoting PO for their population is in itself a challenge, and, if taken up, a new reason to be for vocational training institutions. It leads to a reformulation of the Institutional Intervention Project (PI), understood as the strategic plan of action that will enable training centres to revise and modernise –both in terms of methodologies and strategies- every dimension and component of a policy according to a systemic concept, its interrelationships, contributions and restrictions for the improvement of employability and quality. *PI and PO therefore have an interdependence relationship that means that one's implementation needs the other's implementation and vice versa.*

Besides, the teaching methodology of QEP takes into consideration the device of the project to organise its curriculum design. It is structured in four stages: self-diagnosis, determination of goals and strategies to be viable, definition and planning of activities, and revision and monitoring with a view to strengthening design and team management competencies. These stages suggest "laboratories" and "windows". The former provide guidelines to attendance-requiring activities of the team and they are intended to be regular, in average, once every fortnight. Windows are field work activities; each team must establish by itself the mechanisms to keep contact and to dialogue with the rest of the institution, and in order to transfer what has been dealt with during the QEP to other areas of the institution.

Apart from these activities, a set of teaching materials is offered. These have been designed according to a logic spiral and respond to a progressive theoretical research, high profile of teams, dialogue and interaction. Every participant and every team may balance their reading. There is a primary and compulsory level consisting of Basic Reading Texts oriented to create a common and shared code of the main issues of quality, equity, gender and training. If a person already masters the first level, he may work on the second or third level. Furthermore if, due to the interests or occupational profile of the participant, he is willing to go deeper into any of the dimensions, he may do so by browsing the Model in the Web site, through Reference Documents and/or from the Reference Library. "Supports for action" containing experiences, real or fictitious good practices, videos, exercises, etc. are also offered.

All that has been stated contributes to find a flexible training proposal that enables each team to comply with the requirements according to their interests and their available time. Besides, tutorials adjust processes according to the needs and possibilities of teams. The tutorial is carried out by an interdisciplinary team with specific and supplementary strengths that permanently interact both to make adjustments and to implement activities. The tutorial team is in charge of curricular design, materials development, adjustments, platform management with IT support as well as the contact, exchange and feedback among all the participating teams and it is continuously assessing and readjusting results, contents and activities. Chat has recently been incorporated to the virtual platform together with Skype communication to facilitate the exchange of ideas, foster follow-up and feedback to teamwork, answer queries, etc. Cinterfor's coordination team or technical team always take advantage of their travelling opportunities to the participating countries in order to carry out face-to-face meetings or to take part in activities organised by the teams within the framework of the Innovation Institutional Project.

In what concerns the learning community of QEP, via the use of forums, exchange and discussion spaces have been created on different topics, queries and instructions suggested by tutors and/or other members of the teams, all this with the common purpose of providing feedback and encouraging collective construction of new knowledge and strategies about the design and management of training practice.

In short, this proposal is proving that institutional teams, tutorials and ICT are partners of a cooperative learning process. Among the lessons learned, we highlight the acknowledgment that teamwork is not only possible but compatible with ICT-mediated training actions. In this sense, we must point out the changes that have taken place in the perspective and individual and group attitudes towards the suggested topics and performed activities, in comparison with the initial expectations and beliefs. The Innovation Institutional Projects (PI) drawn up by the teams have determined anticipated problems that helped to revise practices and institutional methodologies according to those approaches.

In relation to the scope, a total of 33 teams have participated in both editions, amounting to 250 people belonging to training institutions from Argentina, Bolivia, Brazil, Colombia, Chile, Guatemala, Nicaragua, Paraguay, Peru, Dominican Republic and Uruguay[7]

The virtual platform

As it has already been stated, these initiatives have encouraged a quality leap of Cinterfor's Website, which, integrated with other interaction and exchange tools and by an integrated and personalised work of its development team, has become a supporting and supportive platform of the ongoing distance training experiences.

In this sense, it should be highlighted that the opening of Cinterfor's Virtual Space (http://evc.cinterfor.org.uy) at the beginning of 2006 has meant a significant advance. It is an interactive space that opens up for dialogue, exchange of ideas and the implementation of distance training actions and, mainly, for the development of learning communities among vocational training institutions of the region.

Until that time, virtual activities were developed in a non-professional and fragmented way, using even different electronic languages. However, the advance and requirements of new proposals have required the incorporation of new software which facilitated its implementation. Therefore Moodle is implemented as an open source software where to install Cinterfor's virtual platform. It is an appropriate virtual environment to

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[7] See detailed information about each institution in Report op. cit.

apply and reinforce distance learning and collaborative learning techniques and it is used in an effective way with all the available technological resources.

The next steps will be:

- to collectively assess strengths and weaknesses of the QEP experience, systematise it and make it available for the training community both in terms of the methodology used and the supporting materials and the platform itself so that, the teams that have already been trained may, if interested, adapt it to their needs and situations;

- to consolidate and make the inter-institutional learning community stable in order to go deeper into knowledge generation and sharing, and in cooperative learning.

Figure 10: QEP Virtual Platform – Cinterfor

- ## TURIN'S CENTRE EXPERIENCE: "COMPETENCY-BASED TRAINING FOR TRAINERS"

This experience has been carried out for more than a decade in different regions of the world and, particularly, in Latin America. There are several examples of Internet-based programmes run by Centre: "Local economic development and cooperatives" http://www.itcilo.org/delcoop/; "Social security in Latin America" http://www.itcilo.org/segsoc; "Enterprise development Services" http://www.itcilo.org/sde/; "Delnet - Local development support through information and communication technologies" http://www.itcilo.org/delnet; "Gender, poverty and employment" http://gender.itcilo.org/; "Post graduate course on Occupational health and safety in the workplace" http://www.itcilo.org/oshcourse and "Competency-based human resource development" http://www.itcilo.org/DRHxC. The latter includes two programmes "Competency-based training for trainers" and "Competency-based human resources management."

The Centre's distance programme uses platforms that have been designed and developed according to the nature, characteristics and needs of the target population. The design of the platform is very simple, user-

friendly and it creates learning environments that are real "virtual classrooms" where the "interaction among actors" is the main pillar of the learning processes.

"Competency-based training for trainers"

This programme seeks to offer training providers and those demanding training an integral and flexible induction and training tool with continuous improvement of the staff involved, either directly or indirectly, for several tasks such as: planning, designing, developing learning means, implementing and assessing training programmes.

It includes three components: competency reference, distance educational strategy and information and communication technologies.

1. Competency reference: It is the organising core component that articulates the programme in five functional areas:

A. Analysing training programme requirements

B. Designing a training programme

C. Designing, adapting and producing learning means and environments

D. Implementing a training programme

E. Assessing a training programme

Each area is divided into different competency units.

This group of competencies enables interested institutions and people to:

- use competency units as a source to technically identify and determine training needs;

- implement, based on such identification, several combinations and variations by building up a specific training schedule according to an integral perspective of training;

- set up an instrument for personalised learning based on their needs by carrying out an assessment to obtain a pre-diagnosis of competencies.

This flexibility made it possible to have "tailor-made" projects upon demand of different users. For example, INSAFORP of El Salvador implemented a project between 2005 and 2006 that benefited more than 400 teachers according to the following schedule:

A1: Identify and analyse vocational competencies

B2: Define teaching/learning objectives, pre-requirements, contents and approaches of a training programme

B3: Select training methodologies and means as well as learning assessment strategies of a face-to-face training programme

D1: Plan the implementation of a face-to-face training programme

D3: Facilitate face-to-face learning

At SENA of Colombia 50 trainers were trained in 2006 in the design of distance training programmes and tutors' training. For example, the schedule "*Distance training programmes design*" included the following competency units:

B1: Select training modalities

B2: Define teaching/learning objectives, pre-requirements, contents and approaches of a training programme

B4: Select training methodologies and means as well as learning assessment strategies of a face-to-face training programme

C1: Design and develop competency-based modules

2. Distance educational strategy

Conceptual framework: Frequently, those who are not experienced in distance training make comments regarding the educational strategy like: *"Who teaches them and who explains to them? Just by reading the materials they won't learn anything, they have to do exercises and, who corrects them?"; "I don't think this would work, how would you follow your group if you don't see the people?" "Besides, students don't get to know each other and each of them works independently..."* These views come from a "traditional" notion of the teaching and learning process.

The distinctiveness of the educational strategy of Turin's Centre programmes and, in particular, of "Competency-based training of trainers" programme is that the process is learner-centred, while the tutor is in charge of facilitating learning. The participant plays a significant role as manager of his learning process, and is responsibly autonomous to comply with the intended results. The tutor must guide the participant and the group in order to achieve the corresponding competencies.

Distance educational strategy dimensions

- The person who learns: uses reference material corresponding to the chosen competency unit, carries out the suggested activities, communicates with his tutor and mates, explores and experiences in his labour context, collects evidences and proposes a final assignment that shows his learning.

- Who teaches? Teaching comes from different sources, such as learning materials, selected articles found in the "On-line documentation centre" and sharing products with participants and by links to sites of interest.

Teaching is taken up by peer students. The interaction with peer students in the group, their views, and partial and final products present a variety of perspectives that foster knowledge construction in a collaborative way. *Teaching is taken up by the tutor* through different interaction modalities with the participant. The tutor does not transmit contents. *Participants and tutors interact in a comfortable communicative atmosphere* that promotes friendly and warm relationships among them.

Participants, tutors and the staff of experts make up a comprehensive support system that contributes to facilitate the learning path journey. IT assistance supplements the support between participants and tutors.

3. Information and communication technologies

ICTs are fundamental because communication between the actors of the learning process would not be possible without them. However, they are basically tools that make up the communication channels but they need contents, and human resources that interact through them, etc.

In fact, the success obtained by the programme has been the result of a studied articulation among the implications of a competency-based approach of training processes, an educational strategy oriented to interaction and personalised attention and the design of a platform that facilitates access to educationally organised information.

CHAPTER 5
ICTs and training for the future: challenges and opportunities

The previous chapters provide concrete evidence of the intensity and richness of the path that has been followed during less than five years by vocational training in our region. Furthermore, they show that it is a non-return process in which innovations are processed in an extremely rapid way. Therefore, collaboration and combination of efforts is essential. Along these lines, the following are some of the identified issues and shared challenges, as well as some suggestions which, after being put into practice by the involved actors, will become opportunities for the community.

GROWTH IN THE TRAINING OFFER: A PHYSICAL OR A VIRTUAL PROBLEM?

The analysis of education in the Latin American and the Caribbean region shows the recurrence of problems of access and stability. Even though basic primary education has been almost fully covered, the permanence and graduation at secondary education has been reduced to 60 percent. This dropout is associated to high levels of poverty and a low quality offer. Besides, it is necessary to consider the fact that the bottleneck of education mostly affects young people, given the high participation of the age group looking for a job.

Although there are no exact figures that may determine the "unsatisfied demand" of vocational training, the amount of candidates enrolling in every new course at Training Institutions is twice or even four times higher than available seats.

It is clear that Training Institutions have been making efforts to increase the offer as the training demand grows. This has usually been achieved by building up new Training Centres, expanding classrooms, workshops and teams and increasing the number of teachers devoted to training.

Due to this mainly physical kind of growth, some problems have arisen regarding an increase in fixed costs, maintenance, surveillance, energy services and sewage system, etc. The new classrooms and workshops are usually calculated according to a certain group of students that would attend such space. If we multiply that number by the number of attention hours, it results in the installed capacity. This is all framed within a traditional way of planning and organising training actions and its flexibility is limited since teaching and learning actions essentially occur in one place, usually during a particular period of time.

The problem of fixed costs is not the only one. Difficulties in enabling the access of users that live in remote places or that because of their jobs cannot attend at conventional times have been increasingly discussed. In this scenario, the most advisable idea would be to promote the increase of distance modalities supported on the available physical infrastructures or even new ones built up for such purposes.

In this sense, it is impossible not to think about whether open and flexible ICT training environments would result in higher quality, more relevant and equal vocational training. Therefore, it is difficult to be sure about the potential advantages of incorporating ICTs into the training offer.

It would be necessary to carry out a close follow-up of the evolution of results in the implementation of ICT-based training. Preliminary figures openly show an increase in the number of participants every year in electronic-based distance programmes in several countries. However, a regional scenario has not yet been consolidated and several training institutions are willing to create an ICT-based training offer. Therefore, the challenge is finding out more about the results obtained as well as their cost-effectiveness and this should be done according to an integrated approach of quality, relevance and equity.

TRAINERS' TRAINING

The teaching role is essential to achieve the objectives set by any training programme. However, this role keeps intricate relationships with the selected educational model and learning environment itself.

This is even more critical in the use of ICTs for training and it poses several challenges to institutions that are starting to implement a training offer as such. How to keep and develop a teaching staff updated in the use

and application of ICTs in training? Must all or some teachers be updated and trained? Is there enough degree of technological literacy to adopt the new languages and changes required by the use of ICTs in training?

In this area, the same way as with technologies, changes usually occur at an extremely fast pace. Although in the 70s and 80s new technologies and their incorporation into productive processes – and consequently into workshops and educational teams – put many institutions into a tight spot regarding their teachers' updating, nowadays, the incidence of ICT in citizens' life is such that their insertion in training process has clearly become a "key competency" without exception.

One could think that the entrance profile of any teacher should include a minimum level of management of ICTs and development and training processes of trainers should facilitate this minimum level for the already hired teachers. Several institutions are already working to enable their teachers to be updated, by using an "Intranet" to communicate through e-mails and working in virtual teams.

But this is just one first step towards the construction of a new profile of teaching professionals.[1] Their involvement is crucial for a new educational style that encourages participation and teamwork, research, causing and solving problems to students who are not in front of them, at least physically. The greatest challenge, in this sense, has to do with effectively creating participative educational environments and generating educational strategies to promote and maintain interactions. At the same time, the student should be considered the main character of the teaching-learning process and it is thus fundamental to reinforce his competencies to continuously learn how to learn. As it has been frequently said, the teacher does not only require a new curricular organisation but different educational resources to reinforce competencies performance and, above all, an ability to contribute to problem-solving, not based on his own responses or strategies, but helping the student to identify his potentials and limitations.

Furthermore, the uniqueness of technical teaching adds the challenge to promote and support the occupational project of students. The idea is to build up a particular profile that continuously incorporates –together with updated specific knowledge – the integration between technology and pedagogy, its application to the whole scope from activity planning to teaching materials, all of them highly contextualised and adapted in two ways: to the productive and social environment and to the different target subjects of training: individuals, groups, enterprises, communities, etc.

FLEXIBLE TRAINING AND THE USE OF ICTS: A POSSIBILITY OR A FRUSTRATED DREAM?

Incorporating a training model with intense use of ICTs is closely associated to a high level of flexibility in training. That is to say, the moment in which training takes place is not fixed, at least according to the same standards of traditional face-to-face instruction. The places in which learning occurs are more varied, the person learns from work, at home or at any point where he "connects" to the contents. The participation level is higher and the participant is encouraged to work and solve problems in a team.

This may evoke some of the one-to-one training principles that were experienced at many institutions during the 70s and 80s. Learning at one's own pace is one of the most requested promises from workers that attend competencies' development programmes offered through the Internet. But this flexibility is challenging educational administration systems and processes of Institutions. The idea of a group as a rate for statistics and of a permanent student during a steady period of time are questioned when using ICTs.

The fact of being able to articulate programmes according to progressive sequences bring about that the amount of hours allotted to the individual contents of each module is considered differently when referring to the importance of a course based on the amount of hours. Inserting and linking this short courses in a significant way may be the key to develop the skills of a person throughout life, enabling him to learn at his own pace and according to his needs. But if this is not done properly, this may be the beginning of a process towards time fractioning of many programmes and would not lead to any effective improvement in the performance or employability of people.

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[1] See Barba E. et al: Enseñar para trabajar. Las competencias de quienes forman para el trabajo. (Teaching for work. Competencies required by those that train for work. Cinterfor/ILO, Montevideo, 2007

Therefore, we take the chance to list some of the aspects to be taken into account regarding the practical implementation of an ICT-based training offer:

- the development and implementation of an ICT-based course usually requires more work than an ordinary course; a higher level of previous preparation is required to take care of details and materials;

- the educational administration is much more complex: entrance application procedures, students' data collection, registration and accreditation of students, data on progress and assessment, and their updating and processing, all require new parameters which should be more flexible and less conventional. (For example, the idea of a group in a classroom during a specific time may change to several teams, in different places and making progress at different paces);

- the support to questions and interaction with participants may turn out different from traditional interaction. Many participants may "log in" at night, or frequently, during weekends. Attention, reading and answering a high amount of messages from participants is more intense than what is usually the case with traditional courses or customary office hours. It is interesting to see that students from these courses keep the expectation of receiving personalised support which is made viable through the easiness of direct communication with tutors;

- the development of techniques, educational methodologies and contents of courses delivered through the Internet demands a high level of team work and task assignment. This produces dependence links among groups of designers, tutors and other actors involved and it requires a high level of coordination.

ACCESSIBILITY TO THE INTERNET AND VIRTUAL VOCATIONAL TRAINING

Access can be tackled from two different perspectives. On the one side, some maintain that poor access to the Internet in the region, particularly in some places, inhibits the success of Internet-based programmes. In 2004 only 10 percent of Latin American population had access to Internet. On the other hand, it is frequently argued that, actually, the work of spreading new programmes using ICTs is a way of increasing the access to knowledge and such technologies. This is reinforced by the fact that the vocational training offered at institutions particularly favours the poorest that have less access opportunities. Many of the training actions in information technologies from training institutions have allowed, thanks also to the work of Ministries of Education, millions of Latin American people to develop key IT competencies. In a way, a form of access is the training programme offer that enables and promotes access itself.

This last reason is particularly sound when we refer to vocational training in Latin America. Training institutions have been, in practice, a way of access to education and work. Their ability to promote new forms of knowledge has always been on trial. Training institutions were the first ones to prove innovative teaching methodologies. They also created module-based curriculum design systems and put into practice mail-based distance learning and a distribution system of readers and contents that modernised the logistic system of the 70s.

New technologies of CNC, CAD, CAM, and a countless amount of acronyms that today symbolise a higher amount of production standards, have been successfully introduced through training institutions. For this reason, it is most likely that the use of ICTs in vocational training may become a unique access mechanism to the new forms of interaction and connection with theoretical and practical knowledge necessary to the working and citizen's life.

The investment levels on ICT that have been registered during the last years in the region for communication networks and access to the Internet were totally unusual if compared to previous periods of time. Several training institutions are implementing investment plans on technological infrastructure, virtual training centres, platform development, teachers' training, and curriculum design. It is therefore difficult to imagine the great potential that all these actions may have in the future with regards to the coverage and complexity of the offered training.

Internet access indicators are rapidly moving towards higher levels of coverage. The growth rates of access during the first years of this decade showed a 150 percent increase in Chile, 136 percent in Argentina, 40 percent in Colombia, 55 percent in Ecuador and 42 percent in Paraguay, just to mention a few countries. Training institutions' investments, public networks and extension programmes on the use of computers pro-

moted as extension and national concern plans from many countries of the region will no doubt contribute so that many more participants see Internet-based training offers as a flexible modality with high accessibility.

This growth, together with the physical infrastructure of institutions, will be an extremely inspiring space for the development of training modalities that combine Internet-based contents input with physical resources such as equipment, installations, simulators, contents input on CDs. "Blended learning" has thus become one of the best options for the use of ICTs in training since it does not leave out completely the idea of some *presence* and it highly benefits from ICTs.

ICT MAINSTREAMING IN THE TRAINING OFFER

Throughout the document the need to improve the access to technologies has been mentioned many times, both from the point of view of infrastructure and its possibilities of use. Costs to access computers and connectivity have continuously gone down but not as much as they did during the 90s. In fact, it is said that costs have diminished because with the same amount of money one can buy more processing power. This assertion, though true in some contexts, does not exert a strong impact on the learning needs of vocational training students and clients, at least not at first.

Nowadays, when training the workforce, it is more important to be able to use a computer than to have one. Vocational training must therefore play a particularly important role, by providing technological resources but, above all, developing competencies to use them. Therefore incorporating ICT transversally into the curriculum, from the very beginning, is an urgent need.

As it has been indicated, an integrated incorporation of ICT during the first years of training will have clear benefits in terms of digital literacy. But ICTs that support innovative learning techniques will have a more important effect: introduce students into research, knowledge association, self-management and interpersonal communication development processes, among others.

Although this benefit is not always well praised, it is particularly necessary when it comes to initial training since a significant portion of students come from basic education that does not favour these competencies. This is the time to start breaking with traditional educational concepts. Institutions are the ones that may have the necessary flexibility to do this since the changes that we suggest are very slowly applied in national education systems.

We have already described a scenario marked by the increasing demand of ICT-competent workers. These competencies go from the simplest ones, such as using an operating system, to handle complex software or software development itself. This demand is being catered for by means of ICT training processes oriented to people that, at the same time, will offer ICT-based services or will implement ICT-associated functions. This way, ICT have no doubt achieved a space within the curricular areas of VTIs for some time now.

The European E-skills forum (technological competencies), of which CEDEFOP is a member, defines three ICT-associated training areas in a report of 2004. The first one includes ICT professionals, from experts on equipment maintenance to specialised sellers of technology as well as software developers, ICT consultants, etc. The second area is that of ICT users and it includes workers that daily apply ICTs in order to carry out their tasks but who do not work specifically on them. The third one consists of a sector oriented to enterprise-management jobs and positions. The forum lists the necessary competencies for these functions under the name of "e-business skills" which would be competencies to appeal to ICTs as a tool to analyse opportunities, process management, logistics and innovation.

As we have seen in this users' classification, ICT training is not the only requirement set by the labour market today and in the future. The sectors of ICT users or ICT-based managers are equally important, since they would contribute to the improvement of productivity and innovation in the economies of the region.

Besides, we should consider all that has been analysed about employability and citizenship competencies. Therefore, the need of ICT-competent people (young people and adults, future or in-service workers) is seen in all economic sectors in their higher productivity requirements, both for large enterprises and SMEs, cooperatives, free-lancers, etc.

VTIs, always aware of these requirements, have reacted by incorporating ICT training to several curricular areas of their offer. Training on Windows, word processors, spreadsheets is now found in curricula that at first sight would not require ICTs. This modality integrates ICTs and has clear benefits such as being a progressive digital literacy process of the workforce as well as an approach to the application of ICTs to a specific training area that is not necessarily associated to ICT.

However, this way of associating ICTs with training areas has limited effects. According to this criterion, the student on his own will have to find the way to apply or not ICTs to improve his productivity; he will have to find out how to make a better use and he will have to be self motivated about the use of ICTs since this approach does not respond to his most direct willingness which is to train in a specific area (carpentry, cooling systems, electronics, etc.) If we consider that most students may access computers and connection at public places provided by VTIs, a recreational interest for Internet and its use is not enough to adopt a training nature. The motivation should hence be approached from a specific training area.

The question is then, what other steps should be taken? Some of them have been suggested but it is worth taking a further look. From an institutional perspective, the actions to be taken are all related to the way in which ICTs are integrated into the teaching-learning process, whether it is face-to-face, virtual or combined.

Up to now, the strongest trend is that ICTs have been incorporated into the offers but not to such offers' areas of knowledge. This integration can only be carried out as long as they are part of the planned training objectives.

Therefore, an effective integration of ICTs into class both by the teacher and the curriculum will rapidly result in greater benefits for life quality in nowadays' technological culture such as:

❖ Digital literacy

❖ Competencies for work and lifelong training:

  • Higher productivity in the specific area.

  • Interpersonal communication

  • Logical and critical thinking

  • Multidisciplinary and team work.

  • Self-management of training career.

❖ Higher effectiveness in the learning process by:

  • Close development with peers.

  • Access to more information sources.

  • Better educational materials

Digital literacy is firstly produced by direct ICT training and secondly by ICT applied and adapted to different training areas.

How do we achieve the other objectives and competencies? It is not possible to think of using collaboration tools, Internet, forums, etc. if the student is not literate in digital terms. It is neither possible to develop quality, adapted educational material if the institution does not invest in generating these skills. None of this could be feasible if teachers of all areas do not generate ICT basic competencies and incorporate educational techniques that enable their effective use to escort and catalyse the learning process. Finally, isolated efforts of teachers will have little impact in the long term if they are not supported by educational methodologies that respond to a technological culture, and, at the same time, have an open curriculum that understands the use of ICT as an educational resource.

Developing and implementing an ICT-integrated curriculum is having in mind, as discussed in Chapter 2, the different functions performed by them in the training process: being a component of teachers' training, an input for abundant and quality educational materials, an educational strategy for curricular design developers and updated topical experts, etc. The formers should apply them to the development of new educational techniques and, the latter should relate them to knowledge, other topics and the necessary technological tools in their area of knowledge.

Considering these approaches, we would like to systematise some orientations and characteristics that should be present in the curricular design in order to achieve a quality, relevant and equitable training:

- Promoting a link between the specific area to other areas of knowledge that have to do with the labour practice. Multidisciplinary and project-based work;

- promoting collaborative work among teachers, sharing local and distance resources;

- use of real cases for analysis, comparison and critical discussion;

- promoting the use of resources developed by teachers and generating an attitude in teachers in order to incorporate the resources provided by students;

- developing strategic devices so that students self-manage their training process;

- promoting cooperative work among students,

- laying progressively the responsibility of progress and assessment on students

- organising planning in order to progressively change verbal and textual instructions into associated, visual and interactive training;

- planning strategies and educational methodologies for different learning styles;

- Preparing teachers to cater for the demands and needs of students without providing always a final answer when they do not know it.

- including self-assessment and peer-assessment activities;

- Planning so that class time is used for discussion and exchange since making information available will no longer be a teacher's responsibility, or will not be provided during class or during virtual communication with the student.

This design cannot be applied to teachers without a suitable competency profile or without the relevant infrastructure.

With respect to teachers' training, the following competencies to be developed should not be omitted:

- understanding learning modes and the ability to teach how to learn;

- ability to assess students' digital work and work processes;

- planning courses and lessons using digital media;

- understanding the aggregate value of ICTs and the ability to apply them in this sense;

- ability to support different learning styles by means of digital media;

- leadership in learning and creativity development;

Regarding teaching materials and tools, it would be necessary to provide teachers and technical team with the following tools:

- teaching resources databases: materials available to be used in class or as a reference to develop programmes and plans. they should be used together with meta information that may help in their search and indicate the population and context in which they were developed;

- case observatory: examples of ICT-integrated applications in different contexts;

- collaborative tools for the development of materials and process analysis;

- Editing and teaching material development tools.

Challenges are complex, multiple and are renewed by every technological conquest, but the opportunities that they offer can be so beneficial and reach so many people that we cannot but work twice as hard and develop collective creativity to overcome them and become more open to tackle those that have not yet been posed.

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