Skills anticipation
The Transfer of the SENAI Prospective Model

Latin America and the Caribbean outlook

Fernando Vargas Zúñiga (Coord.)

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1 Introduction

1. Introduction

At a time when change takes place at such breakneck speeds, is it actually possible to anticipate training demands? This is precisely the question being addressed by the transfer programme for the SENAI Prospective Model, which is presented here.

It has become commonplace to recognize the rapid changes that have been occurring in the labour market, many of them driven by technology and its effects on work organization. Together with the ageing of the population, the evolution of the labour skills that companies require is one of the structural factors that are shaping the world of work, as the ILO's report, "World Employment and Social Outlook: Trends 2015" has shown.

In addition to these swift technological changes and their impact on forms of work organization, the region continues to exhibit low productivity and competitiveness indicators. The range of exports is limited, to the point that of the top ten Latin American exports, most are agricultural, and in just three different categories (video devices, computers and vehicles), production is concentrated almost entirely in one country (Mexico).

Vocational training has an essential role in promoting change and diversification in the region's productive structure. The demand for skills, the incorporation of new microelectronic technologies, the new materials and processes for production, and environmental sustainability are some of the factors involved in the push for more complex and more analytical skills which, at the same time, require higher levels of knowledge and training in basic science, reading and mathematics. In the current context, it is essential to be able to forecast needs in relation to skills and thus bring training opportunities into line with the changing demands of the world of work.

The Director-General of the ILO has submitted a proposal to the Governing Body, which includes a study to explore the changes that are having an impact on work. In a recent paper,[1] he has referred to the principal forces that are transforming the world of work; among them are: the repercussions of demographic change, the transition towards environmental sustainability, technological developments, the new profiles of poverty and prosperity, the increase of inequality as a serious threat to social justice, and the evolution of production and employment.

1 "Towards the ILO centenary: Realities, renewal and tripartite commitment"; Report of the ILO Director-General to the 102nd ILC. Geneva. 2014.

Similarly, in its resolution and conclusions on employment,[2] the International Labour Conference requested the Office to organize specific databases containing experiences and tools for the anticipation of training demand. This measure complements others taken in the same area, such as the decision to boost research on the skills shortage and its implications for employment and training policies.

ILO/Cinterfor's experience in providing technical assistance at different levels shows that there is increasing demand for analytical skills for non-routine interaction contexts, which include capacity for analysis, interaction, effective communication and problem-solving in team work.

Work environments are increasingly incorporating technology and operating means that reduce direct intervention in routine tasks that are carried out by automated systems. This also implies the need for more complex applied knowledge and greater requirements in terms of education and basic skills.

In Latin America and the Caribbean, VTIs have always made efforts to obtain updated information about the demands that the world of work makes on training. The speed of change affecting occupations and work organization has increased the risk of obsolescence for programmes and, therefore, for workers' skills.

In answer to this need, Brazil's SENAI developed a method to anticipate change and generate transformation responses in existing training programmes or in new programmes being devised. This method is based on the prospective analysis of technological and occupational trends within a specific occupational sector, with the purpose of pinpointing training demands and ensuring that they are in line with the programmes being offered.

SENAI's foresight model has the advantage of generating links with enterprises, universities, research, science and technology centres and other stakeholders, in order to obtain the best possible outlook of the technological and occupational context. In Brazil this model has been applied to industries such as: textiles, petrochemicals, heavy equipment, telecommunications, construction, footwear, food, foundries, shipbuilding and ship repairing and industrial automation.

I Transfer programme for SENAI's Prospective Model

In answer to requests received from several of ILO/Cinterfor's VTI members, since May 2012, a transfer programme is being carried out for SENAI's Prospective Model. This programme has included the following stages:

- Definition of an occupational sector to be analysed
- Identification of sectoral specialists
- Training of an institutional executive group to coordinate the study

2 "Employment policies for sustainable recovery and development". Resolution and conclusions of the recurrent discussion on the strategic objective of employment. ILC. ILO. Geneva. 2014.

- Establishment of specialist panels to be consulted about technological trends and occupational impact.
- Analysis of technological trends
- Analysis of occupational impact
- Drafting recommendations for vocational training

The programme has been implemented for all of the VTIs in Latin American and the Caribbean and some of its principal outcomes are:

- 22 countries covered
- 78 VTI and Ministry of Labour technical staff trained in the tool
- 22 foresight studies conducted
- Database (http://www.oitcinterfor.org/en/documentos/estudiosprospectivos)
- Prospective Studies Network (http://evc.oitcinterfor.org)

The aim of ILO/Cinterfor in this publication is to summarize the three components of the process. One is a recent analysis of the principal trends observed in the world of work and in Latin America's economic situation, prepared by the Centre's team. The second is an updated methodological summary of the foresight model, prepared by SENAI, and the third is a summary of VTIs, sectors and studies.

Thanks to the cooperation of SENAI, the programme will focus on providing support for VTIs that wish to conduct new studies, as well as for their effective implementation by modifying, changing and updating VTIs' training programmes. This Directorate wishes to thank SENAI for its generous contribution to the programme as well as, of course, all of those who have taken part and shown interest in continuing to improve the training offered in the region, in search of improved opportunities for workers and better conditions for enterprises and their environment.

Enrique Deibe
Director, ILO/Cinterfor

2 Ibero-american labour markets. Brief assessment and foresight

2. Ibero-american labour markets. Brief assessment and foresight [3]

2.1 Introduction

A distinctive feature of economic recovery in most countries in Latin America is that it took place together with growth in employment. Between 2004 and 2014, employment went hand-in-hand with growth. In many countries, this made it easy for the flow of income to families to increase, together with an upsurge in consumption.

However, although Latin America has been growing without interruption over the last ten years, since 2012 the year-to-year variation in GDP has been falling. Because of this, many feel that growth is slowing down, which poses a good many challenges for countries and their employment and training policies.

As the ILO's Lima Declaration of 16 October 2014 has noted, over the last decade, notwithstanding its achievements in terms of economic growth, lower unemployment, reduction of poverty and improvement in other labour indicators, Latin America continues to be marked by major inequalities. The combat of inequality requires integrated economic and social public policies that promote social inclusion, decent work, and productive employment, as well as an enabling environment for sustainable enterprises.[4]

Anticipating future scenarios in the field of labour skills development is one of the most frequently-used measures in the face of the uncertainty that this kind of downturn entails. The following paper was prepared as an input for the Ibero-American Summit of Heads of State and Government, held in Mexico, and provides a brief description of principal trends. It is based entirely on the examination of documents from several sources, including ILO, in order to analyse the labour market's main trends, with a focus on the demand for labour skills and, therefore, for training and capacity-building.

I Is Latin America initiating a new cycle? The slowdown and the end of the commodities boom

In general terms, the countries of Latin America and the Caribbean were able to circumvent the worst effects of the 2008-2009 crises on their economies, avoiding heavy impacts on employment and work conditions. After a slight drop in GDP in 2009 and an increase in unemployment, in 2010, growth was 6 percent, and unemployment fell steadily in 2011, reaching pre-crisis averages.[5]

3 Fernando Vargas Zúñiga and Soledad Nión.

4 See ILO. 18th American Regional Meeting. Lima, Peru, 13-16 October 2014. AMRM.18/D.5. http://www.ilo.org/global/meetings-and-events/regional-meetings/americas/amrm-18/WCMS_314401/lang--en/index.htm

5 The ILO in Latin America and the Caribbean. Advances 2010-2011 and Perspectives 2012-2013.

Projections for 2014 indicate that the region may grow only 1.5%, less than the International Monetary Fund (IMF)'s most recent forecasts, which pegged growth in Latin America and the Caribbean at 2% for the current year and at 2.6% for 2015.[6]

- This downturn is mainly the result of the slump in Brazil's economy, which has undergone two consecutive quarters of negative growth, and the economic problems that countries such as Venezuela and Argentina are facing.
- On the positive side are the Central American countries and, particularly, Mexico, where it is anticipated that the positive outcomes of the structural reforms adopted recently will begin to be seen, as well as the favourable effects of the economic recovery in the United States.
- For his part, the Director of the Western Hemisphere Department of the IMF, Alejandro Werner (2014), cautiously noted that "the process of reform is a painful one", as Mexico has shown, where the GDP suffers the negative effects of uncertainty and adjusting to the new regulatory scenario. However, the "macroeconomic stability" with which the commodities boom experienced by the region was imbued stands out as a positive factor, unusual in a region used to economic overheating.

The current slowdown is a new phenomenon in the continent, which is more accustomed to sudden boom and bust cycles. According to forecasts, one of the principal problems is the potential growth in the medium term of around 3%. This is an "insufficient" figure with which to face the regional economic challenges resulting from the growth of the middle class, one of the big achievements in Latin America in the first decade of the century.[7]

One of the greatest challenges facing the Latin American economy is the lack of productivity and competitiveness, and the scant diversification of its exports: of the ten leading Latin American exports, "seven are commodities", and the remaining three (video devices, computers and vehicles) originate almost entirely from Mexico. To which is added the absence of large regional infrastructure projects, which are falling behind, and which experienced their last major push in the sixties and seventies (De la Torre, 2014).

Similarly, in general terms there are differences to be seen from one country to another with regard to job quality, the underlying idea being that countries that invest in job quality are those that progress the most. Over the last decade, there has been some success in reducing the effects of vulnerable employment. However, disparities between quality jobs continue to be significant.

In this context the ILO is especially concerned for youth. 4 Latin America and the Caribbean have a total of 104 million young people, many of whom have not benefited from the recent economic growth. This is reflected in youth unemployment – which is double or even triple that among adults – and in the large number of young people who are neither studying nor working (20 percent of the total). As a result, young people question the value of education and the labour market as vehicles for social and personal advancement.

6 José Juan Ruiz, Chief Economist, Inter-American Development Bank (IDB). In Portfolio. Bogotá. Oct. 2014.

7 Augusto de la Torre (2014) World Bank; Chief Economist for Latin American and the Caribbean.

In addition, many young people, especially the very poor and those in dysfunctional families, have to take decisions about their education, work or families without proper information or guidance, with no point of reference or in places where socialization does not help identify successful pathways towards decent work.

This has an economic and social cost, hampering companies' capacity to innovate and develop competitive edges and unions' capacity to strengthen collective action, thus reinforcing perverse relations of exclusion and social fragmentation.[8]

I Spain and Portugal: signs of recovery and the challenges of resuming growth

After the European crisis and the GDP contraction in Spain in 2008, the recession slowed considerably during 2013. Indeed, the annual GDP growth rate went from –2 per cent in the last quarter of 2012 to 0.5 per cent in the first quarter of 2014.[9]

However, in terms of employment, the challenges facing this country are many, owing to the fact that it suffered one of the most severe contractions in Europe as a result of the crisis. Analysts point out that this drop was related to the country's excessive dependence on the construction industry. (ILO, 2014) People working under temporary contracts were the most affected (between 2008 and 2011, temporary employment accounted for about 90% of job destruction) and unemployment mainly hit young people and people with lower levels of education.[10]

In the final quarters of 2013, data showed a certain decline in unemployment, owing to the creation of new job sources. This trend was accompanied by improving business dynamics and self-employment results.

In Portugal, the path marked by the impact of the economic crisis triggered in 2008 continues. Job loss was significant (one in seven), which makes this labour market one of the most severely affected by the European crisis.[11]

In this case, a number of policies encouraging employment have been implemented, which focus on improving the qualifications of the work force, in keeping with a commitment to an economy intensely dependent on knowledge, innovation, research and development. These tendencies entail a commitment not only to generating more jobs, but also to improving their quality.[12] Beyond this, economic recovery and employment indicators still tend to be sluggish. Within the broader terms of labour reform, some changes have developed with a view to creating new jobs (related to the reduction of redundancy compensation and contract changes), although the consequences in the quantity and quality of temporary jobs are not yet clear.

8 The ILO in Latin America and the Caribbean. Op. cit.

9 ILO. Spain. Growth with jobs. 2014.

10 Op. cit.

11 http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_228208.pdf

12 http://www.portugalglobal.pt/ES/InvertirenPortugal/PerfildePortugal/Paginas/MercadodeTrabalho.aspx

According to ILO's recommendations (2013), it is necessary to develop new strategies focusing on employment, in order to counteract the country's unfavourable tendencies: the drop in real wages and less access to credit for small and medium enterprises (SMEs).

Despite their differences, a variation in exports with high technological content has been identified in both countries as a sign of recovery, which endows them with competitive possibilities internationally. Nonetheless, at present, this is not enough to compensate for the sustained weakness of domestic demand, which began several years ago. Both countries have undertaken labour market reforms and have joined in bilateral efforts as part of their recovery strategies.

> ...the region must define its inclusion speed in the global world and to face at the same time the greatest growth in its economically active population in history. We know that structural change at a global level implies challenges for employers, people, education institutes and governments. The speed and extent of the demographic, scientific, technological, cultural, social and economic change is enough to overwhelm anybody (Manpower, 2013).

2.2 The labour market. General features of supply and demand

In 2013, the urban unemployment rate in Latin America and the Caribbean once again reached record lows, overtaking the region's historic rates, which a decade ago showed two-digit unemployment figures (11.1% in 2003). However, in 2013 there was already evidence showing how the loss of economic buoyancy affects the labour market, with the stagnation of certain work-related indicators. Furthermore, the drop in unemployment also poses a significant political challenge for the countries in the region; namely, the need to improve job quality (ILO, 2013, "Employment Trends 2013").

2.2.1 A predominantly young labour supply

One of the challenges facing the labour market in emerging and developing countries is the need to create 200 million new jobs over the next five years, in order to keep up with the growth rate of the working age population. In this respect, the issue of youth unemployment is significant – in some countries it reaches figures that are three times higher than those for adult unemployment – as is the work situation for women and other population groups that are traditionally vulnerable in terms of social integration.

I Latin America, a youthful continent: opportunities and challenges of the demographic bonus.

According to data provided by ILO, there are a total of 104 million young people living in Latin America and the Caribbean, many of whom have failed to benefit from recent economic growth.[13] Specifically, this is observed in youth unemployment levels, which doubles that of adults, and – most particularly in the number of young people who are neither in employment nor in education or training (20% of the total in 2013).

13 The ILO in Latin America and the Caribbean. Op. cit

As a result, there are misgivings concerning the value of education and the labour market as vehicles for personal and social advancement:

- ...many young people, especially the very poor and those in dysfunctional families, have to take decisions about their education, work or families without proper information or guidance, with no point of reference or in places where socialization does not help identify successful pathways towards decent work.
- This has an economic and social cost, hampering companies' capacity to innovate and develop competitive edges and unions' capacity to strengthen collective action, thus reinforcing perverse relations of exclusion and social fragmentation. (Op. Cit.: p.9).

In this respect, the demographic bonus is extremely favourable and constitutes a window of opportunity which should not be neglected.

The **demographic bonus** implies that the proportion of people in productive age brackets grows steadily in relation to the proportion of people of potentially inactive ages. Dependency relations descend to record lows, and then increase. This descent generates a specific opportunity for countries to develop by taking advantage of this demographic feature, since it increases the possibilities of saving and investing in economic growth. According to ECLAC data: In a period of approximately 30 years, between 1960 and 1990, Latin America went from having some of the world's highest fertility levels to levels below the international average. In other words, changes in the age structure of the population, especially ageing, are occurring faster in Latin America than they did in the industrialized countries, which points to the need to develop situation-specific measures to tackle the challenges and take advantage of the opportunities raised by the demographic changes. (ECLAC, 2009. Social panorama of Latin America 2008. http://www.cepal.org/en/publications/social-panorama-latin-america-2008http://www.cepal.org/cgi-bin/getProd.asp?xml=/publicaciones/xml/2/34732/P34732.xml&xsl=/dds/tpl/p9f.xsl

- Latin America is experiencing its tenth year of sustained economic growth: inequality has abated in the 17 countries for which data exists, owing to improved income from work and better returns on education at the lower end of the income distribution.
- Nonetheless, the region continues to face structural difficulties that hold back its potential for progress in the fight against poverty and inequality.
- People's economic behaviour varies according to their stage in life, and, therefore, changes in the age structure of the population tend to have a significant impact on the economic development of countries.

Drawing on household surveys and spanning a period of three decades, a study produced for ECLAC (Viollaz, 2014) explores young people's entry into the labour market in ten Latin American countries. The author noted that: (i) the employment status of young people had deteriorated over time until seeing an improvement in the late 2000s, although youth unemployment and informality rates are still very high; (ii) young people are entering into a typical employment cycle in which they are surpassing the results obtained by adults of earlier generations. Informality is not a part of this pattern, however, indicating the existence of penalties associated with youth informality.

(See: http://www.cepal.org/prensa/noticias/comunicados/2/52512/RevistaCEPAL-112_hojainformativa_Jovenes- laboral_revAH-OK.pdf)

(http://repositorio.cepal.org/bitstream/handle/11362/37020/RVI112Viollaz_en.pdf?sequence=1

The high proportion of working age people constitutes a favourable scenario for economic growth for the countries in the region (with specific features in the age structures of each country),[14] by means of increased income and the accelerated accumulation of capital as the result of the high proportion of workers and the reduction of expenditure on the dependent population (ECLAC, 2008).

These opportunities resulting from the demographic situation of many countries are being threatened by conditions of exclusion and vulnerability in which working age people find themselves; most particularly, the young who are entering the labour market or are at an age to enter the secondary education system.

In order to combat working age population changes and increase employment, labour market participation is being promoted in Spain and Portugal, most especially by accelerating access to jobs for young people.[15]

I Schooling rates: the success of primary education and challenges facing middle education

In general terms, the countries in the region show evidence of positive levels of full schooling rates in basic primary education. However, these high schooling rates coexist with high numbers of dropouts.

The implications of schooling

...the nations that achieve high levels of schooling in successive stages of the education cycle are the best equipped to face the challenges of the knowledge society. Sooner or later, a sustained increase in the level of education will result in greater opportunities for equitable development. This means that more educated societies create a greater capacity for innovation and change, which is an essential prerequisite for their successful entry into the process of globalization. Moreover, once education has become universal in a country, this reduces linguistic and social handicaps, and promotes equality of opportunity.

Iberoamerican PISA Group, 2006

http://www.sel-gipes.com/uploads/1/2/3/3/12332890/iberoamerica_in_pisa_2006.pdf

14 Most of the countries in Latin America are experiencing this favourable period, although with differences: in some cases, the stage is ending (for example, in Argentina and Uruguay), while in others, it is just beginning (for example, in Bolivia, Guatemala and Haiti).

15 http://www.portugalglobal.pt/ES/InvertirenPortugal/PerfildePortugal/Paginas/MercadodeTrabalho.aspx

As the Ibero-American PISA Group[16] (GIP) 2009 report points out, while primary education is compulsory in all the countries analysed, and there are no rates lower than 92%, there are still differences, which are likely to disappear over time in view of the importance of education at this stage: all countries should achieve full schooling.

The difference between countries is greater in secondary education (including both lower and higher levels), and within the GIP, only Spain exceeds 90% for 2006. With the exception of Chile, no Latin-American country under review (Argentina, Brazil, Colombia, and Mexico) reaches the threshold of 80% in secondary education.

I Rethinking the quality of education: the basic skills gap

Widespread indicators such as those provided by PISA tests have led to the conclusion that education is failing to generate the skills required for the information and knowledge society.[17]

- For 2012, the region ranked within the lowest third.
- In reading, mathematics and science, Latin American countries performed among the 20 worst ranked (Chile is in first place in the region and Peru is last).[18]
- Employers' main demands and the bottlenecks perceived and measured in some countries are related to deficiencies in skills needed for reading, writing and handling numbers.
- According to an IDB report,[19] one in two young people have difficulty in understanding simple texts, while three in five are not capable of performing simple mathematical calculations.
- There is also a lack of personal skills in terms of effective relationship skills, citizen engagement and others.

In view of the fact that productivity and competitiveness are the focal points of development in Ibero-American countries, secondary education poses an inescapable challenge: quality secondary education is needed to ensure that young people have access to higher-productivity jobs and thus to incomes which will enable them to remain above the poverty line (ECLAC, 1998). This is the way to obtain significant improvements in terms of equity and social cohesion and to avoid the pitfalls of the intergenerational reproduction of poverty. Specifically, the demographic bonus opens up an opportunity for moving towards universal coverage for secondary education in conjunction with on-time progression.[20]

16 Programme for International Student Assessment.

17 See PISA 2009 report, GIP http://www.ineed.edu.uy/sites/default/files/gip_2009_iberoamerica%20en%20pisa%202006_Parte1.pdf

18 Spain: http://www.mecd.gob.es/dctm/inee/internacional/pisa2012/boletin21pisa2012.pdf?documentId=0901e72b8178650b
Latin America: http://publications.iadb.org/bitstream/handle/11319/698/Am%C3%A9rica%20Latina%20en%20PISA%202012%20%3a%20%C2%BFC%-C3%B3mo%20le%20fue%20a%20la%20regi%C3%B3n%3f.pdf?sequence=1

19 See www.habilidadesyproductividad.org

20 ECLAC, 2009. Social panorama of Latin America 2008. http://www.cepal.org/en/publications/social-panorama-latin-america-2008http://www.cepal.org/cgi-bin/getProd.asp?xml=/publicaciones/xml/2/34732/P34732.xml&xsl=/dds/tpl/p9f.xsl

A precarious transition to adulthood. An example provided by Uruguay

Dropping out of school early implies a premature transition to adult life. This transition is associated with a problematic entry into adult life, since a lower educational level of achievement comprehensively hampers access to the more highly qualified labour market sectors, which are deeply segregated in Uruguay. Thus, the assumption of family-related adult roles does not conform with the possibility of a solid entry into the world of work. This difficulty in performing a solid transition to adulthood in public life (in the education system, the labour market) implies, to a certain extent, restricting life projects to the domestic setting. (…)

Although the education level achieved and continuing within the education system at this stage of the life cycle is a factor which reduces the possibility of initiating motherhood, it is evident that there are teenage girls with a high level of schooling who do still become mothers prematurely. (...)

Dropping out of the education system, difficulties encountered in attempting to enter the employment market and the presence of additional children in the household (the offspring of teenage girls) contribute to reinforcing the poverty cycle in which households were probably already immersed before the teenage pregnancy and maternity.

Varela-Fostik (2010), Maternidad en la adolescencia en el Uruguay: ¿incorporación anticipada y precaria a la vida adulta? (p.16-18)

I Young people who are neither in employment nor in education or training; building life projects

A predominant feature among these young people involves their limited willingness to take part either in education or in work. The ILO has noted the strong effects of this inactivity in the region's productivity and competitiveness.

The gap between work supply and demand widens with the existence of young people who lack not only the basic skills required by the market, but also any perspective and/or motivation to enter the labour market.

The proportion of young people who are neither in employment nor in education or training has declined, but this group is still numerous. Cárdenas, de Hoyos and Székely (2014) estimate that 18.5% of young Latin Americans aged between 15 and 18 neither study nor work (9.4 million people). As these authors indicate, this large number, which represents about 19% of the population of that age group, constitutes one of the most discouraging challenges facing the region.

Specifically in the case of women, lower schooling rates are associated with higher fertility rates, which increase the probability of falling into inactivity in terms of work and education. In order to take advantage of the opportunities provided by the demographic bonus, countries need to ensure that their young people receive an adequate education and job opportunities, so that they can increase their productivity levels over the coming decades. If young people are not provided with full entry into the job market, they will, in future, stop generating the income required in order to accommodate the

higher dependency rates, which are expected to increase again in two decades. This, in view of the number of young people who neither study nor work, implies attempting to increase understanding of the causes of this situation and developing specific policies in order to address it.

I Skilled migration and unresolved work expectations of highly educated young people

A reverse trend exists which involves the increase of skilled migration.

- The employment challenge is also qualitative; namely, creating jobs that meet the expectations of the more highly qualified young people, who currently display significant migratory mobility in their search for better and more highly-paid jobs.
- For a specific group of young people, improving educational levels can lead to gaps between the skills they acquire and those demanded in their countries of origin. At the same time, there are also wage gaps between receiving and sending countries of qualified young people.

According to data provided by UNFPA, the better qualified people who emigrate in Latin America constitute between 50% and over 70% of the more highly-skilled workers in their countries of origin, which means that investments in education and training made by poorer countries are wasted.[21]

This underpins the need to address the absence of appropriate mechanisms to guide training to match labour market trends and vice versa:

- work on the widespread idea that the world of work is not an effective means of social promotion and mobilization;
- address the lack of connection between education and work paths, in order to cater to a variety of problems; connect the differing realities of education and work (McKinsey, 2013).

As a way to retain the more highly skilled human capital, it is essential to boost a diversified productive capacity in the countries in the region (ILO, 2014. World of Work Report).

I Family arrangements and care systems in the context of gender labour equity

Despite developments in recent years, most of the region still lacks institutional mechanisms which provide incentives for caring for the population from earliest childhood. Gender bias persists in family structures, concerning occupation and time devoted to care, which competes with women's dedication to work.

In the economic development of Latin America over the last decade, there are groups of the population that have benefited more from labour participation and income than others.

21 http://lac.unfpa.org/public/cache/offonce/pid/2023

"The low-hanging fruit of progress" and "the high-hanging fruit" in terms of labour participation and income.

There are groups of the population that have greatly benefited from economic changes in Latin America, and others that have been left behind. Gender differentials: significant increases of labour income within both groups, but particularly for males. Based on monthly wages, the gender pay gap seems to have increased in 2009 in comparison to 1995. Interestingly, when looking at hourly wages (...), the pay gap between females and males is lower. This could suggest that females are more likely to work part-time (...) (...) despite differences across countries, male adults aged 25 to 64 have benefited the most from rising monthly wages. With clear differences across selected countries, adult males present greater labour participation rates and higher wages in 2009 with regard to 1995. (...) It is important to take into account that this gender pay gap is not exclusively associated with female wage discrimination. Source: A UNDP study, in which six countries with high GDP growth were analysed: Argentina, Brazil, Chile, Dominican Republic, Mexico, Peru and Uruguay; Martínez-Restrepo; Gary Molina (2013) "The High-Hanging Fruit of Latin American Progress" UNDP, New York.

http://www.revistahumanum.org/revista/wp-content/uploads/2012/09/BRIEF-1-2012.pdf

Analysing the situation in terms of gender equity, we note that income has increased for both males and females, but particularly for males. Based on monthly wages, the gender pay gap seems to have increased in 2009 in comparison to 1995. (UNDP, 2013)

"When looking at hourly wages (...), the pay gap between females and males is lower. This could suggest that females are more likely to work part-time (...) (...) despite differences across countries, male adults aged 25 to 64 have benefited the most from rising monthly wages. With clear differences across selected countries, adult males present greater labour participation rates and higher wages in 2009 with regard to 1995 (...) (Op. cit.). If urban and rural labour market data are compared, gender gaps are seen to increase in rural areas" (ILO, 2013).

This gender pay gap is not exclusively associated with female wage discrimination. Other factors such as job informality, part-time jobs and sector wages differentials can also account partially for this gap (UNDP, 2013. p.8). The family structures adopted and the bargaining that takes place explain these female working arrangements.

Beyond this and despite the slowdown of labour indicator improvements, during the first quarter of 2013 the gap between men and women in terms of labour participation, occupation and unemployment continued to close.

Furthermore, young women in the most adverse socio-economic settings occupy a special position; for them, making work and education compatible with parenting is usually difficult. With a view to facilitating their integration, a number of different situations should be considered:

- There are women who drop out of school at an early age and who, therefore, must endure low employability, given their limited skills.

- Even for women with higher educational levels, who remain within the education system, it is difficult to reconcile parenting with education and work. (Varela – Fostik, 2009)

Raising children is beset with contradictions at the different stages of the life cycle of women. The absence of policies for reconciling family and professional life and, even further, joint responsibility policies is an aspect which helps to foster the contradictions between motherhood and the personal development of women, while at the same time, it exacerbates gender inequalities, both within families and in public life (Varela, C. ,2008. In: Varela – Fostik, 2009).

The males in the region find it a great deal more difficult to find jobs with flexible hours and teleworking possibilities, in order to reconcile their work away from home, with parenting. This is related to persisting cultural expectations in the region, in keeping with the tradition that men must perform their day's work outside the home (Manpower, 2013).

I The exclusion of socially vulnerable population groups

An inescapable aspect is the diversity of ethnic populations and population groups with a number of different disabilities, who are not yet fully integrated into the education system or the labour market.

Despite the region's good economic performance, there are persisting and significant gaps between urban and rural poverty indicators, with rural poverty being slower to reduce.

- In Latin America, forced labour still takes place among the indigenous population, among inhabitants of areas where the State is not present. This is not seen as a crime, but as the result of a dependent relationship which is part of traditional social and power relations.
- Even when not actually subjected to forced labour, indigenous peoples often operate as cheap labour, in appalling working conditions, underwriting the economic models of countries at the service of local and international markets – mainly urban.[22]

The lack of data and difficulties in obtaining information on the condition of education and labour in these communities specifically, are challenges the region must overcome if more inclusive development is to be achieved.

The Afro-descendant population, amounting to between 20% and 30% of the population in Latin America, has a history of very high levels of poverty, social exclusion and discrimination of every kind. Data on schooling and secondary education coverage are even more alarming.

- In recent years, some countries have produced legislation and care policies aimed specifically at this population group, in order to ensure that Afro populations can enjoy their rights, but the enforcement of laws and regulations is weak and much remains to be done in this regard in the region. [23]

22 http://www.un.org/esa/socdev/unpfii/documents/session_10_crp_4.pdf

23 http://www.afrodescendientes-undp.org/index.php?lang=en

- It should be noted that over the last decade, information and specific studies have been produced on the social and economic situation of Afro-descendants, leading to positive input for the design of affirmative action policies that will address the problems that affect this population group to the fullest extent. An example of this is the specific inclusion of questions in censuses and household surveys, which target ethnicity and racial identification in order to facilitate the segmentation of outcomes and conduct focused analyses.

- However, much remains to be done in terms of labour market integration with the purpose of increasing employment rates, job formalization and decent work.

Finally, with regard to population groups with some type of disability in Latin America,[24] it should be said that people with cognitive and mental deficiencies or a limited capacity for self-care find it the most difficult to integrate economic and social activity. Visual and motor disabilities have the least negative impact on access to education and employment. [25]

- The region's most economically and socially vulnerable groups have higher rates of disability. This means older adults, people in rural areas, indigenous or Afro-descendent peoples and low-income groups.

- Adjustment to the education system and integration into the labour market still leave much to be desired Although there are laws that compel educational centres to include access for persons with physical disabilities, and public institutions to recruit quotas of persons with physical, cognitive and mental disabilities, the fact is that these regulations are not fully enforced and that challenges persist in all dimensions of social life.

For all of these groups, problems take on different aspects, depending on the Latin American country being analysed, as a result of the ethnic melting pot which is characteristic of the region and its history of relegation, both in traditional means of integration and in positions of power and decision-making. The role of the State is fundamental in promoting and safeguarding the rights of these population groups, as well as in promoting the cultural re-education of society as a whole, in order to achieve their full integration, making full use of existing capacity, with respect and dignity.

2.2.2 ...and diversified labour demands

Labour market demands are heterogeneous. A small portion of the productive fabric, which comprises large, highly productive companies that compete on the global market, coexists, in contrast, with a large proportion of small and medium enterprises, which constitute over 90% of the productive units, with low productivity levels and generally informal working practices.

24 "According to data from the 2010 round of censuses, disability rates [in Latin America] range from 5.1% in Mexico to 23.9% in Brazil, while in the Caribbean the proportion varies between 2.9% in the Bahamas and 6.9% in Aruba. In total, almost 12% of the Latin American and Caribbean population is thought to live with at least one disability, and this represents around 66 million people (according to various statistical sources in the region that are not always comparable)." Source: http://www.cepal.org/notes/74/Titulares2.html

25 http://www.cepal.org/notes/74/Titulares2.html

Information provided by IDB[26] reveals that one in three enterprises lack the workers they need in order to innovate and become more productive, and 90% of enterprises fail to find skilled workers. It concludes that it is skills and not years of schooling that explain the percentages of between 50% and 65% of future entries on the labour market.

I A diverse productive structure with broad productivity and competitiveness challenges

Development needs a strategy to diversify the economic base, while at the same time, improving the capacity of sustainable enterprises to generate quality jobs.

- As a basis for development, countries should have a diversified productive fabric, and generate a favourable environment in support of enterprises and entrepreneurs, which foster the existence of quality jobs.
- In Latin America there are few medium or large enterprise that make intensive use of technology. In general, the productive fabric of these countries is composed of SMEs, with low productivity and widespread informal work practices. Of the 11 million companies with workers in the region, only 26% have over 6 employees, while 77% have 5 employees or fewer (ILO, 2014). In fact, most jobs are in the field of self-employment or are provided by SMEs (86.5%).

Changes in the proportion of jobs in the primary sector in relation to services in Latin America show that workers migrate mainly from unskilled work, low wages and low productivity in agricultural and manufacturing industries to the same kind of jobs, but in services (the retail trade, construction, transport, the informal sector such as street sellers, domestic workers or beauty salon owners). "In Latin America, although the tertiary sector represents 62% of its sector composition, [its] contribution ... to the GDP of the region's countries is lower than in developed countries; the primary sector [still being] ... responsible for more than twice the region's wealth." (Manpower, 2013).

In this respect, there appears to be a need for countries to avoid focusing their economic growth on a few sectors involved in exports, with little relation to the rest of the economy (ILO, 2014).

I The huge challenge of keeping industry going. Change and persistence in the productive structure. Productive diversification and formality

There is still a tendency in the region for industry GDP share to drop, a reduction which has been accelerating since the eighties, as a result of redirecting the regional productive structure towards natural resources and services. Measures are being attempted in several countries to encourage, and even protect this sector, which faces the difficult challenges of competing with more competitive or more productive imported goods.

Latin American societies are facing the challenge of generating favourable business and entrepreneurial environments, with the support of productive diversification strategies and the development of work formality.

26 Op. cit.

Poverty reduction is slowing down, since a large part of the poor population is composed of groups that fail to benefit easily from existing policies (older people, unemployed youth, working age women outside the labour market).

> …employment policies were accompanied by enterprise promotion policies, stressing their sustainability. Using ILO methodologies like SIYB, WEDGE and SIMAPRO, many countries (including Honduras, Nicaragua, Mexico and Colombia) have strengthened their entrepreneurial fabric, especially among micro, small and medium businesses. Bolivia has supported the cooperatives sector (with new legislation soon to be passed). In particular, SIMAPRO has shown itself to be a useful model for promoting different aspects of decent work (productivity, wages, social dialogue, health and safety, collective bargaining) in specific sectors (including sugar mills, fruit sector, tourism and car manufacturing) in various of the region's countries (México, Chile, Cuba, Dominican Republic and El Salvador)
>
> (Source: the ILO in Latin America and the Caribbean. Advances 2010-2011 and perspectives 2012-2013).

In view of the predominant productive structure in the region, rather than produce economic benefits to reach people with fewer resources by means of good jobs in the manufacturing industry, the recent economic growth has occurred as a result of an exponential increase of domestic consumption, which has driven the growth of the booming services sectors (ECLAC, 2014 p. 4). The increase in income from work has focused on the services sector, from which women fail to benefit and – even – youth employment is ignored.

I The higher demand for basic skills and increasingly complex content

There is a clear mismatch between the skills that employers require and the skills that young people and adolescents acquire in the education system.

According to an IDB study, the increase in the quantity of educational production does not go hand-in-hand with an increase in quality. This has two readings:

1) Latin American students currently complete more years of schooling, although they fail to master the knowledge and skills they are supposed to learn.

2) The knowledge and skills they are acquiring are not the knowledge and skills they need to be successful in their working and social life.

In other words, there are evident disparities between supply and demand; between the knowledge and skills that employers seek and what the young people in the region actually learn.[27] According to data provided by Manpower (2013), close to 28% of employers in Latin American countries state that they find it difficult to fill jobs.

In fields such as Biotechnology, Nanotechnology and the use of ICTs, the demand for more complex skills and forms of work organization is continually being updated. Their impact on education systems

27 http://publications.iadb.org/bitstream/handle/11319/3995/Ideas%20for%20Development%20in%20the%20Americas%2c%20Volume%2027%3a%20The%20Skills%20Gap%3a%20Teens%20in%20the%20Workforce.pdf?sequence=1

is immediate; basic knowledge and skills become more complex and demand new interpretation skills, a dimensional conception, and other abilities.

Green jobs demand the transformation of skill profiles at different levels. As part of this Green Jobs Initiative, the ILO Skills and Employability Department defined a global research project to investigate skill needs for greener economies. A series of 21 country studies was conducted in partnership with the European Centre for the Development of Vocational Training (Cedefop) (...)[28] Green economies impact the labour market in three ways:

1) Greening the economy has an impact by shifting jobs from one sector to another, reducing demand for some labour skills and increasing others, for example, in the increase of renewable energy (solar and wind) and the decline in the use of fossil fuels.

2) As a result of the adoption of new regulations, and the development of new technologies and practices, entirely new occupations emerge, which demand new training courses and adjustments to qualification systems.

3) New skills will be necessary for the workers who perform numerous occupations in numerous sectors, as part of the process of greening existing jobs.

Skill changes arising from green jobs

For example, within the automotive industry, workers across a range of jobs from engineering design to the assembly line will have to work with new fuel efficient technologies. In another example, farmers in many parts of the world will have to adjust to more severe drought conditions, requiring them to learn how to grow new crops or new methods for producing the same crops. This source of change in skill requirements is the most widespread: in fact, it will be pervasive, and calls for a major effort to revise existing curricula, qualification standards and training programmes at all levels of education and training.

http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_159585.pdf

The shortage of specific skills has already been identified as an issue that hampers the full development of green economies.[29] This implies a need to: address the coherence between labour skills and environmental policies and the structural changes which will take place in some sectors, such as the automotive industry.

Some enterprises, known as "multilatinas"[30], have developed novel trading and administration models for the Latin American business culture, including management and entrepreneurial skills which are new in the region. These companies are making great progress in sectors such as infrastructure, energy,

28 http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_159585.pdf

29 http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_164630.pdf

30 While they are not a new phenomenon, they have only recently become significant, in view of their major contribution to direct foreign investment in several countries.

finance and food processing.[31]

I Bottlenecks in filling vacancies: are we witnessing a skills gap?

Knowledge globally is becoming increasingly intensive, while the speed of change constantly leads to obsolescence. A highly qualified workforce is essential to attract technology-intensive investment. The availability and composition of the workforce's labour skills are crucial in winning the race to attract investment decision-making in the region, and positioning countries on global value chains (for example, a higher level of knowledge, technological skills, marketing and business skills).[32]

- A mismatch between supply and demand for skills in the labour market has high economic and social costs and contributes to structural unemployment and to creating low quality jobs. Early identification of current and future skills needs is part of a forward-looking strategy that reduces skills gaps (...) (ILO, 2008).[33]
- These results are similar to those in the McKinsey Report (2013), based on an analysis of employers' opinions, which found that there is, around the world, a shortage of job seekers with critical skills. "Across the nine countries that are the focus of this report (Brazil, Germany, India, Mexico, Morocco, Turkey, Saudi Arabia, the United Kingdom, and the United States), only 43 percent of employers surveyed agreed that they could find enough skilled entry-level workers. This problem is not likely to be a temporary blip; in fact, it will probably get much worse. The McKinsey Global Institute estimates that by 2020 there will be a global shortfall of 85 million high- and middle-skilled workers."[34]

31 Foro Multilatinas. América Economía. 2014.

32 Strietska-Ilina, 2014. Skills and Employability Branch. Employment Policy Department. ILO, Geneva

33 http://ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_103457.pdf

34 http://mckinseyonsociety.com/education-to-employment/report/

The mismatch between the skills and competencies that employers require and what the workforce offers. Peru

According to the survey, 34% of the companies said that job seekers lacked technical skills, a further 32% replied that they could not find enough job seekers, 24% found that applicants were not sufficiently experienced, and 19% answered that candidates lacked sufficiently well-developed soft skills.

The most demanding jobs

The most difficult jobs to fill are those that require specialized technical personnel, engineers and information technology specialists, as well as executive and managerial positions, stated Lizárraga.

However, in addition to specialization in a specific professional field, employers are attempting to find workers with additional skills to complement their occupational profiles, according to Experis, a Manpower Group consultant.

It is not all about specialization

In the survey, 36% of the companies stated that they found it very hard to find English-speaking personnel, which was very frustrating, particularly in the case of experienced professionals with the right specialization, but who claimed in their resumes to handle the language only 'at an intermediate level', when the requirement was for an advanced level.

A further 35% could not find professionals or technicians with research skills, for 35% it was analytical skills, 30% stated that applicants lacked planning and organization skills, 26% said they had no knowledge of information technology and 15% claimed not to find applicants with skills involving management in complex environments.

Because of this, between 20% and 25% of job seekers are unsuccessful, since they lack the talent requirements that the organizations seek.

Regional situation

Experis Peru also reported that there is a similar situation around the world, where 35% of companies claim they encounter these problems. The average in the region is 38%. In Chile, 40% of the companies have come across this difficulty and in Colombia, 32%.

Because of this outlook, the wages of highly specialized technicians have increased in only a few years, from two thousand Peruvian soles to two thousand US dollars. Meanwhile, the high demand for personnel to fill management positions has meant that wages for these jobs have increased 10%.

Source: http://www.senati.edu.pe/eti/noticias/464/nuevo-estudio-revela-falta-de-tecnicos-especializados-en-ti

At the same time, it is essential to generate entrepreneurial and innovative skills, capable of taking advantage of the new worldwide productive trends in order to put them to good use in the region. This is still a very significant challenge in Latin America, as it implies not only connecting education and the labour market, but also coordinating both dimensions based on the identification of future productive niches.

"[Vocational] training was a core element of ... active employment policies. The ILO has continued to promote models for updating training based on the competencies needed for the region's labour markets. The Inter-American Centre for Knowledge Development in Professional Training (ILO/Cinterfor), with its knowledge management platform, provided the opportunity for a discussion of successful experiences and ongoing materials, in the region and with other countries. One example is the progress in the standardization of occupational profiles in the construction sector in Argentina, Brazil and Peru. In Peru, the labour reconversion programme ('Vamos Perú'), whose design and evaluation is ILO-sponsored, won an award from the United Nations as an example of best public management practice worldwide."

(ILO in Latin America and the Caribbean. Advances 2010-2011 and perspectives 2012-2013, pp. 14-15)

I A better balance is needed between ecosystem services and socio-economic development

Companies interact with ecosystems and ecosystem services.[35] They make use of these services while at the same time, they modify the ecosystem. Data show that "two thirds of the ecosystem services it examined are being degraded or used unsustainably".[36] In addition to its ramifications for society at large, this environmental degradation will affect productive activities themselves in a variety of ways.

Report of the UN System Task Team on the Post-2015 Development Agenda

In its report "Realizing the Future We Want for All" (2012), the UN System Task Team on the Post-2015 UN Development Agenda lays out its main findings and recommendations for a development agenda beyond 2015. It calls for an integrated policy approach to ensure inclusive economic development, social progress and environmental sustainability and a development agenda that responds to the aspirations of all people for a world free of want and fear.

Source: http://www.un.org/en/development/desa/policy/untaskteam_undf/report.shtml

- If current trends continue, ecosystem services that are freely available today will cease to be available or become more costly in the near future. Once internalized by primary industries, additional costs that result will be passed downstream to secondary and tertiary industries and will transform the operating environment of all businesses.
- Loss of ecosystem services will also affect the framework conditions within which businesses operate, influencing customer preferences, stockholder expectations, regulatory regimes, governmental policies, employee well-being, and the availability of finance and insurance.

35 The Millennium Ecosystem Assessment defines "ecosystem services" as those benefits that people obtain from ecosystems. These benefits can be direct, as in the production of provisions, such as food and water ("provisioning services"), or the regulation of features such as floods, land degradation, desiccation, soil salinization, pests and disease ("regulating services"), or indirect, through the functioning of ecosystem processes that produce the direct services ("supporting services"). Examples of supporting services would be the processes of photosynthesis and the formation and storage of organic material; nutrient cycling; soil creation; and the assimilation, neutralisation and detoxification of wastes. Ecosystems also provide people with non-material benefits such as aesthetic pleasure, recreational opportunities, and spiritual and cultural sustenance ("cultural services"). There are thus a range of ecosystem services, some of which benefit people directly, others which do so indirectly. http://www.cifor.org/pes/_ref/about/ecosystem_services.htm

36 http://www.millenniumassessment.org/documents/document.353.aspx.pdf

- There must be a balance between economic growth, the use of ecosystem services and the impact of productive exploitation on climate change.
- Degradation, appropriation and expropriation of natural resources lead to phenomena that are not just environmental, but also social: rural-urban migration, poverty belt expansion and exclusion, qualified agricultural workers who become unskilled industry or services workers, cultural changes in the indigenous population, and so on.
- There is a margin of opportunity for the development of new emerging businesses based on the demand for more efficient and/or different ways of using ecosystem services, in order to mitigate their impact. In this respect, green job initiatives and currents of thought such as bioeconomics emerge – sustainable development opportunities for Latin American countries rich in natural resources.

Sustainable Development Goals

One of the principal outcomes of the Río+20 Conference was the agreement reached by a number of member states to develop a set of sustainable development goals that would result in a tool to focus coherent action on the issue of sustainable development. The Rio outcome document gave the mandate that the development of these sustainable development goals should be coherent with and integrated into the UN development agenda beyond 2015. An Open Working Group composed of 30 members has the mandate to develop a set of sustainable development goals for consideration by the General Assembly at its 68th session (2013-2014). The technical support needed by the General Assembly's Open Working Group will be provided by a technical support team from the agencies that operate under the sponsorship of the United Nations System Task Team on the Post-2015 UN Development Agenda.

Source: http://www.un.org/es/development/desa/development-beyond-2015.html

2.3 Where is the demand for skills heading? A forward-looking vision

In a context with increasingly rapid changes being introduced by technology in the ways to organize work and in the demand for skills, there is widespread consensus regarding the need for mechanisms to anticipate demand, as a means to enable adaptation to training and capacity-building programmes.

- Means of anticipating demand are not highly developed in Latin America. Although several studies and programmes have been conducted, which we refer to in this paper, devices used to observe and monitor market variables have not been fully appropriated by intermediaries or vocational training.

The future of work will involve greater mobility and flexibility. This means an active and dynamic future, multidisciplinary and with training and adaptation needs that must be continuously updated.

In its meeting of June 2008, the International Labour Conference adopted a Resolution concerning skills for improved productivity, employment growth and development, where

- education, vocational training and lifelong learning are established as central pillars in building the necessary skills for sustainable social and economic development, and

- it was stressed that there was a need to forecast the skills and competencies related to sectoral and national development strategies.

A mismatch between the supply and demand of skills has high economic and social costs, leading to a vicious circle of structural unemployment (ILO, 2013).

In this respect, a number of different foresight studies have emerged in Latin America, Spain and Portugal. The most relevant of these are based on the experience of ILO/Cinterfor with the application of the SENAI Prospective Model. In addition, some of the region's labour market observatories have been consulted, as well as private sources, such as Manpower's study on the development of talent.

I The supply and demand of Latin American talent

The distance between talent supply and demand can be understood as 'gaps' in talent integration: the profiles that employers look for and which are difficult to find (technical-functional gap) and people's expectations when looking for work (psycho-social gap).

- A study produced by Manpower (2013)[37] indicates that in Latin America, employers say that they need a specific kind of talent (more or less skilled), which they find it difficult to find on the labour market.
- The skills being sought in the region include the capacity for team work, communication, personal relationships and decision-making. The talent which appears to be most difficult to find involves sales, production and accounting.

I The SENAI Prospective Model

Brazil's National Service for Industrial Apprenticeship (SENAI) has developed a model to forecast occupational demand, which uses foresight techniques based on technological and organizational analyses, as well as the analysis of emerging occupations and occupational trends.

In these studies, information is generated on the basis of interactions with a variety of social stakeholders: universities, businesses, science and technology centres, sectoral experts, etc.

37 Manpower, 2013. Latin American Talent Integration into the Labor Market.

Foresight as a tool

Occupational and technological foresight is based on an observation of the labour market and an analysis of social, economic and technological trends, with the purpose of determining vocational training needs and ensuring that they are tailored to employment. In consequence, it makes it possible to:

• Bring initial education programmes into line with present and future needs.

• Anticipate current, mid and long-term qualification needs, in order to ensure a better match between jobs and qualifications.

• Provide all interested parties, particularly displaced workers and those who seek better work opportunities, with appropriate information so that they can change over from declining sectors to those that are doing well.

• Support young people so that they can base their training choices on realistic employment perspectives.

• Enable more informed decisions regarding investment in training and continuing education on the part of employers and workers.

• Make contributions to enterprises in the field of innovation and new technology adoption, through the timely availability of appropriately qualified workers, as well as by upgrading workers' competencies and helping them to continue to be fit for employment.

(ILO, 2013) http://www.oitcinterfor.org/sites/default/files/file_publicacion/prospective_0.pdf

Country and industry-based foresight studies

Foresight studies have been identified for 27 countries in Ibero-America, most of them in the tertiary sector and some involving country-based trends. The following table shows the industries for which foresight analyses exist and the countries where strategic opportunities have been identified.

SECTOR	COUNTRY	TRENDS
TRAINING	ECUADOR / SPAIN	The productive sector focuses on short-term training, related to technical and administrative knowledge (in the case of Ecuador), targeting adults in particular (in the case of Spain), training and hands-on experience.
TOURISM	GUATEMALA / SPAIN / PERU / ARGENTINA / BRAZIL / URUGUAY / MEXICO	A focus on vocational training in languages, ICT development and use, as well as the uptake of environmental awareness. Specifically in the case of INTECAP, it is pointed out that these technologies will possibly impact the occupations of hotel administrator, tourism enterprise administrator, tourism technician and hotel technician, but with varying levels of skills.
CONSTRUCTION	EL SALVADOR / PERU / DOMINICAN REPUBLIC / BRAZIL / ARGENTINA / URUGUAY	In addition to the importance of specific technical skills, there is emphasis on cross-cutting skills. Highest demand is for team work, followed by problem-solving and learning capacity. The development of basic skills is a critical focal point in boosting the potential of this sector. Likewise, respect for security regulations, good human relations, environmental maintenance and the use of tools / machinery.

RENEWABLE ENERGY	SPAIN / BRAZIL	In Spain, the renewable energy industry appears as one of the possible drivers of employment in the country, but training is in short supply for this area. It is acknowledged that knowledge acquired in mechanics, electricity and electromechanics is good, although there are serious deficiencies in the command of English. It should be added that for Paraná, emphasis is on research and analysis skills.
GREEN ECONOMY AND BIOTECHNOLOGY	SPAIN / BRAZIL	It is forecast that the green economy will evolve very positively, encouraged by a favourable regulatory framework and increasing environmental awareness campaigns and education plans. Therefore, future skilled employment needs in this area have been identified as one of the highest priorities over the next few years. Biotechnology is also an area which will evolve significantly and where it is essential to develop analytical and research skills, in order to make these processes sustainable.
AGRI-FOOD	BRAZIL	Sixteen occupations were identified here. Some of them are: biotechnology applied to the food industry / new food product development / food literacy / eco-friendly packaging / innovation management / food irradiation / agri-forestry.
FRUIT AND VEGETABLE	SPAIN	Future goals mentioned are better production planning, more extensive trading, direct sales, boosting online sales and the use of social networks. The occupations that will be most in demand in future are: foreign trade specialists; marketing and sales technicians; key account managers –creative, with skills in marketing, management techniques, sales, promotion, market penetration – and specialists in farm business as a business unit.
LOGISTICS	SPAIN	Occupations with highest percentages in increased demand forecasts are: foreign trade experts; lorry drivers; sales agents and representatives; trade and sales managers or marketing managers; senior engineers and logistics specialists; logistics graduates; stock and/or warehouse management technicians; traffic controllers in transport companies in general; and supply, distribution and/or logistics managers and technicians in general.
AUTOMOTIVE	SPAIN	As a job generator, this sector has high-level training requirements. The increase of automated processes implies a need for fewer, but more highly qualified workers at all professional levels and categories, with a need to break away from the "learning-by-doing" training model and move towards more updated methods.
NATIONAL	COLOMBIA / PERU/ SPAIN / PORTUGAL	Studies show the severity of the educational deficit (under-qualification) in certain key sectors of the economy and the high prevalence of informality. For example, in Peru and Colombia, this applies most particularly to mining. In Portugal, furthermore, there is an evident mismatch between training supply and demand. In Spain and Portugal an increase has been detected in future demand for skilled workers, especially in services.

I Skills development in key sectors of the economy in the region

Foresight studies have also been found to have a potential for development in traditional activities in the region, where there is still much to exploit. Such is the case in ***tourism***, ***logistics***, the ***automotive industry*** and ***construction***. These sectors encompass opportunities that are considered across a large number of countries in Latin and Ibero-America (Guatemala, Spain, Argentina, Peru, Brazil, Uruguay, Mexico, El Salvador and Dominican Republic).

As an institution which is at the forefront of vocational training, capacity-building and technical assistance, the Technical Institute for Training and Productivity (INTECAP) has sought new learning methods, models, techniques and strategies in order to contribute to improving the performance of Guatemalan talent and thus address the needs of persons and companies. In May 2013, it conducted a foresight exercise with the TOURISM SECTOR, in view of the importance of this industry as the second largest revenue generator in the country. It was determined in the technology foresight study that the technologies that are most likely to be adopted in the communications, connectivity and promotion systems of tourism enterprises are:

- IT telephone systems for data-transmission via the Internet.
- Local communication systems for hotel and tourism enterprises.
- Tourist promotion virtual reality systems.

These technologies will possibly have an impact on the following occupations: hotel business administrator, tourist business administrator, tourism technician and hotel technician, although at different levels of competency.

A study conducted by ILO/Cinterfor on the tourism sector in Argentina, Brazil, Mexico and Uruguay, concluded that it is fundamental and essential to invest in education and vocational training for human resources, particularly in languages and ICT development and use, as well as in the uptake of environmental awareness, the weakness of which is viewed as an obstacle to the industry's development and to the encouragement and consolidation of defined environment preservation policies and quality standards.[38]

In Portugal, a first set of activities were identified as growth opportunities, by means of a foresight analysis performed in 2011: tourism, energy and the environment and mobility and transport. At the same time, in some of these sectors there are not enough human resources who are technically qualified, and have leadership and business management capacity, which seriously hampers the promotion of eco-industries and services.

Source: http://www.igfse.pt/upload/docs/2011/analiseprospectiva.pdf

I New technologies and new skills

Moving towards sustainable development in the region, decisions made about training and education that make it possible to adapt to change and resolve the labour market's current and future needs, become particularly significant. Considering that technology is one of the principal elements of change,

38 See http://www.oitcinterfor.org/sites/default/files/file_publicacion/informecompleto_tendencias.pdf

which triggers job creation, we should stop focusing on "what we are" and begin to think about "what we're doing" and "what can we contribute" (Acosta Seró, 2007).

There are new technological developments which are growing gradually but steadily and demand specific training: Integrated ICTs, software – particularly 3D printing systems, new commodities and others.

According to studies performed in Brazil and Spain, in the Renewable energy sector there are predominantly regular and highly skilled jobs in rural and/or industrial areas, where there is still a shortage of training. They are related specifically to three types of energy: wind, photovoltaic and biomass. The interesting thing is that most of these jobs are not considered to require the creation of new occupations, but merely adapting existing jobs by means of vocational training.

Biotechnology, for its part, is an area which involves a number of different productive sectors: research and development of living organisms, or parts of them, industrial processes or specialized services. It has applications in various fields; among them, agriculture, human health, animal health, the environment and energy.

In the study on job profiles in industry in Paraná, 21 job profiles were identified in relation to Biotechnology. These job areas included: biodiesel /biodiversity /bioethanol /biogas biohydrogen / biocomputers/ biomass/ biomaterials / biotechnology security applied to biotechnology / biotechnology for the pharmaceutical and veterinary industry/ biotechnology for plant protection/ biotechnology used to minimize greenhouse gases/ biotechnology in livestock health/ biotechnology in waste management/ programming in biotechnology genetics and livestock improvement/ genetics and plant improvement/ nanobiotechnology/ nutrigenomics and pharmacogenomics / enzymatic processes / biotechnology regulatory processes.

While each job has its own special features, they all have some points in common:

- Identifying and selecting raw materials.
- Developing ways of improving the effectiveness of production processes.
- Analysing the economic and financial feasibility of processes, identifying market niches.
- Conducting research into resources and new technologies for the application of productive processes.
- Implementing quality improvement procedures.
- Analysing economic and financial feasibility.
- Implementing training systems.
- Developing plans to preserve the environment and analysing current regulations.

For example, in Spain, the Technological Energy Institute (ITE) is promoting careers in renewable energy engineering, one of the activities in most demand. Renewable Energy Engineers should be trained in Industrial Engineering (or Technical) and have three to five years' experience in the field; a command of English is highly valued, as is a command of technical documentation and regulations and standards. They should also be skilled in organization and planning, clearly results-based, be able to handle stress and be available to travel. (...) Jobs most in demand in this area: plant manager, production manager, head of maintenance, production machinery operators.

Source: https://www.sepe.es/contenidos/observatorio/mercado_trabajo/1840-1.pdf

In occupations identified for the future of industry in Paraná (Brazil), it is recognized that there is a need to conduct foresight studies in the use and application of technology. Ways in which it can increase the efficiency of chemical energy conversion to electricity, planning and managing research projects, developing new products with more capacity for energy storage, evaluating the life cycle of power accumulators. In addition, its use in logistics projects for the transport accumulator plan; the implementation of improvements to reduce risk to workers and the environment to a minimum; waste management, including recycling; transport; temporary storage and the elimination of non-recyclable components.

See:http://www.oitcinterfor.org/publications/perfis-profissionais-o-futuro-da-ind%C3%BAstria-paranaense

I Devices to monitor the market and synchronize it with training and job services. Labour market observatories

It is essential to put monitoring devices in place in order to provide a constant stream of information on the evolution of the market. Some countries and regional partnerships have established labour market observatories with a view to monitoring the situation in their countries.

For example:

- Chile (Liaison Network of the Ministry of Education and Chile Foundation Education Programme) http://www.educarchile.cl/ech/pro/app/detalle?id=200312
- Colombia (Ministry of Labour) http://www.mintrabajo.gov.co/empleo/observatorios-regionales.html
- México (Labour and Social Security Secretariat) http://www.observatoriolaboral.gob.mx/swb/
- Peru (Regional Office ILO) http://www.ilo.org/americas/publicaciones/observatorio-de-la-crisis/lang--es/index.htm
- Uruguay (Ministry of Labour and Social Security) http://www.mtss.gub.uy/web/mtss/observatorio-de-mercado
- Mercosur http://www.observatorio.net/

México's Labour Observatory, sponsored by the Labour and Social Security Secretariat, is a public online service which provides information on the characteristics and behaviour of the most representative occupations and professions in Mexico. It contains significant information on employment indicators, as well as job opportunities and advice on writing CVs. It also conducts opinion surveys related to people's perception of skills demanded, work assessments, training they want and other issues. In this respect, it provides an example of a comprehensive approach to the condition of the labour market, targeting the different stakeholders involved, and attempting to bring together expectations, skills and

requirements. According to recent data (2013), the best employment rates (37%) in the country are for jobs in:

- Business Management and Administration
- Accountancy and Auditing
- Law
- Medicine and
- Computer Science

As regards data involving women, it appears that their highest employment rates involve jobs that entail a greater level of services and care: teacher training in basic education, preschool, social services, nursing and health services and teacher training for other educational services.[39]

The challenge of relating supply to demand

Colombia's Labour Observatory, established in 2005, offers a similar service, but its contents are more detailed, including details on the graduation training paths and employment rates of every education provider in the country. Young people can view this information at the national, regional, state and city level. There is a longitudinal dimension to this, meaning that the trajectory of students is tracked over time (whether they went on to further training, which institution they attended, what they studied, when they found employment, what their starting salaries were, and so on). So a teenager in Medellín could look up an economics course at the local university and get an idea of the fate of those who went before. Usage has more than quadrupled since the launch, with 190,000 single visits to the website in 2012, and the government is working to increase awareness of the site and to improve its interface in order to increase traffic. (McKinsey, 2013).

I Environmental sustainability and its impact on skills development: there is no single path towards development

The emergence of new jobs in "green" areas is a notable trend. Just as ICTs spread throughout the economy, transforming a large part of the workforce into "knowledge workers", ecological technologies and work practices will also spread and generate a noticeable group of "green jobs" on the labour market.

As some foresight studies point out, and with a view to promoting diversified productive capacity,

- not only should the development of skills for the manufacturing industry (related to faster economic growth and job creation) be borne in mind,
- but also, and in light of several positive experiences, for agricultural and rural development, with an efficient and equitable use of natural resources and services to connect these areas to the rest of the economy.

39 http://www.observatoriolaboral.gob.mx/work/models/ola/Resource/253/2/images/Panorama_ejecutivo_2013.pdf

Natural resource and environmental restrictions, which all countries are facing, can become advantages for developing and emerging economies if they know how to take advantage of the opportunity of taking a technological leap (ILO, 2014: 5). Green economies are an opportunity for developing countries with less well-developed industries and, therefore, lower levels of carbon gas emissions (ILO, 2014).[40]

According to estimates of the Green Jobs Project, in Spain there are about 60,000 businesses and institutions whose main activity involves one of the typical activities of green economies. That is, they are dedicated to protecting the environment, providing services related to preventing and/or minimizing pollution and the use of natural resources, or producing goods that contribute to these two goals. These companies and institutions directly employ close to 320,000 people. If nuclear energy-related activities are added, the green economy currently accounts for 2.2% of the total jobs in Spain (407,200 people) and 2.4% of GDP at market prices (25,000 million euros a year). In relative terms, the green economy has now grown to a size similar to that of the whole of the primary sector (agriculture, livestock and fishing) or to that of Spanish industry's two most important sectors: the food industry and the metal and metal products industry. There appears to be consensus in pointing out that the prime mover of the green economy is the wide-ranging and extensive environmental body of law, which has contributed widely to the increasing demand for environmental goods and services, and, consequently, to the creation of direct and indirect jobs.

2.4 Conclusions and recommendations

Taking advantage of the opportunities provided by the demographic bonus implies designing macroeconomic and social policies targeting productive investment, the increase of job opportunities and the promotion of a stable social and economic environment towards sustained development (ECLAC, 2009).

To overcome these obstacles and move forward in creating quality jobs, respect for fundamental rights at work, the enabling environment for sustainable enterprises, effective social dialogue based on mutual confidence between governments and representative and independent employers' and workers' organizations are essential. (ILO, 2014. Lima Declaration)

A sustainable development strategy implies the existence of coherent growth policies and directing the public and private sectors with the purpose of:

- generating favourable environments for the development of sustainable enterprises that produce quality jobs,
- on the basis of productive diversification, where the size of SMEs becomes an opportunity for the development of flexibility and innovation as organizational competencies grounded on knowledge.

2.4.1 An inclusive and sustainable supply of vocational training...

Investing in devices to provide immediate information on supply and demand, in order to anticipate skills development and reduce talents gaps and the shortage of workers.

40 http://www.ilo.org/wcmsp5/groups/public/---dgreports/--- dcomm/documents/publication/wcms_243965.pdf

- Strengthen the efficiency of information systems linked to public employment, monitoring and market observation systems, as generators of "intelligent" information to aid decision-making related to designing, modifying and/or suppressing training programmes.

New forms of growth should contemplate means of future inclusion, both for persons who have not yet entered the job market, and for those in jobs about to disappear and/or where there is oversupply.

- Foresight studies are an essential input in determining what jobs to create, as well as – and most especially – in determining what jobs can be redirected to other sectors, as in the case of renewable energy.

Initiate social dialogue in the process of establishing training needs and job profiles, in order to encourage investment in the development of skills and knowledge.

- Effective partnerships between governments, employers' and workers' organizations, and training institutions and providers are critical to anchor the world of learning in the world of work.[41]
- Facilitating mechanisms for dialogue on training demands, the design of training programmes and the assessment of their outcomes has proved to be a successful measure in many countries.
- The training institutions, with tripartite management boards, which exist in nearly all of the countries in the region, are an asset for Ibero-America which should be maintained and strengthened.

Insisting on the continuous improvement of the quality and relevance of training for work.

- A need to perform regular impact assessments of training and to facilitate means of coordination between the private and public sectors in order to move forward in training.
- Most education and training systems should adopt the practice of conducting frequent and systematic evaluations as a significant source for decision-making and policy design.
- Adopting performance standards in agreement with employers and workers as proven tools for quality enhancement. These standards arranged by skill level and classified into sectors, provide the market with greater transparency and become genuine frameworks of reference for countries' qualifications.

Improve access to training and employment for the more vulnerable population groups: wage earners in informal jobs, women and young people: take advantage of the potential of the company and workplace as a setting in which to learn and develop practical skills.

- The increasing importance of learning mechanisms that alternate between the company and the training centre. A method which has always been used and is well-known in Latin America, but which, for a number of reasons, is not used to its fullest advantage.

41 ILO. A Skilled Workforce for Strong, Sustainable and Balanced Growth. A G20 Training Strategy.

- Encourage agreements between private enterprises and training centres, in order to formalize work-linked learning programmes, which foster job placement for young people on the basis of meaningful training experiences.
- Efforts with regard to gender equity at work must continue. For example, promoting policies that support work-family balance and social dialogue on equality of opportunities and work conditions for men and women. In this respect, the tripartite committees have carried out significant work on the matter of this balance, throughout the region (ILO, 2010-2011).

ICTs as partners in the inclusion of the most neglected population groups in training and the labour market: people with disabilities, the indigenous population and Afro-descendants.

- Distance training by means of the Internet increases training opportunities and the capacity to respond to the needs of enterprises.
- The situation of these population groups in particular, makes it necessary to develop inclusion mechanisms, for example, by means of affirmative action policies, both in the education system and in the labour market, addressing their specific features, strengthening their capacity and respecting their specific cultural capital.
- In the case of indigenous populations, there is an opportunity to link their socio-cultural heritage to the promotion of ecosystem services, with a view to developing green jobs and biotechnology.

ILO Study – Maternity protection: good for workers, good for small businesses

Benefits for both

"New ILO research led by the Conditions of Work and Equality Department (WORKQUALITY) and ENTERPRISE departments and carried out with the United Kingdom's Middlesex University – Maternity protection in SMEs: An international review – suggests that maternity protection is not only feasible for SMEs, it can in fact result in benefits for both companies and society as a whole.""...with adequate maternity protection and work-family measures, staff members in these companies are more likely to stay with the same company, which means savings on recruitment costs. Absenteeism is also reduced as employees feel more committed and motivated. But for parenthood to become 'a normal fact of business life' we need new policies that take into account the specific characteristics and needs of SMEs. In particular, these regulations would include national laws and policies that protect maternity and support work-family balance at minimal or no cost to employers, in combination with targeted support measures."

No cost, high returns

"The ILO study shows that some maternity protection measures can be implemented with little or no cost. Support for breastfeeding at the workplace is a good example of a provision that constitutes a 'win-win scenario' for both employers and employees. SMEs can benefit directly through increased staff retention and enhanced staff commitment, and indirectly from the well-documented advantages that breastfeeding brings to the health of women and their children. Finally, the report calls for more and better research on the outcomes of maternity protection provisions in SMEs, especially in developing countries where large numbers of SMEs operate in the informal economy and the majority of women have no maternity protection.""This is partly due to the growing number of workers in part-time, casual or temporary work arrangements, which are less likely to qualify for maternity protection rights. Added to this is the burgeoning evidence of pregnancy and maternity-related discrimination, especially as many businesses struggle to stay afloat in economic downturns. The report's recommendations are an attempt to turn the tide on disadvantages related to maternity so that women like Noemi anywhere in the world can become new mothers while also retaining their livelihoods, dignity and ability to provide for their families."

Source:http://www.ilo.org/global/about-the-ilo/newsroom/comment-analysis/WCMS_314238/lang--en/index.htm

2.4.2 Coordinating the labour market supply and demand implies coherent policies, social dialogue and boosting cooperation

Industry-based training strategies, productive diversification and incentives for productive enterprises by means of coordination between the educational supply and the demands of organizations.

- The talent gap, from the standpoint of employers' needs and the potential of Latin American economies, bearing in mind the opportunities of the demographic bonus, reflects the need for coordination between the educational supply and the demands of organizations (productive setting, educational institutions and governments' active promotion) (Manpower, 2013).
- In addition, the development of cognitive skills and the recognition of "soft" skills, related to behavioural and personal features (personal responsibility, perseverance, team work) needs to be addressed.

- Use bipartite or tripartite sectoral councils to match sectors' demand for skills with training provision, anticipate future labour market and skill needs, and assess the quality and relevance of training programmes.[42]
- It is essential to foster a culture of innovation to make companies competitive and sustainable.

Skills development plays a crucial role in less developed countries; opportunities should be seized with regard to developing markets for the new technologies, attracting investment and creating sustainable and decent green jobs for an increasingly large workforce.

More and better skills alone do not create jobs, yet, in conjunction with other employment and macroeconomic policy measures, they:

• contribute to job creation in new and potentially greener economic activities;

• enhance productivity in existing jobs and capacity to move up in value chains or economic sectors;

• help shift jobs towards more sustainable ways of production and consumption;

• help people adjust to changes and better prepare for environmental shocks and labour market transitions; and

• can act as a driver of change and innovation by spurring investment in new green economic opportunities.

Source: ILO. Greening the economies of least developed countries: The role of skills and training

Committing to resource sustainability through the development of specific skills, by means of public policies that contemplate the coordination of productive development with inclusive growth and the care of the environment.

- Consider the region's environmental wealth, its biodiversity and per capita water supply, as a resource to be watched over and preserved as part of its development differential.
- Occupations associated with environmental and biodiversity preservation are assets to be developed in the region.
- Entrepreneurship training and business coaching for young people and adults to start up green businesses in conjunction with microfinance projects, as strategies for development, growth and education-work synergies.[43]
- Human talent overall is a resource to be boosted, and to this end, Latin American companies should set up valuable links with teaching institutions, while at the same time, they should be given the opportunity to operate in an environment favourable to innovation and the creation of quality jobs.

42 ILO. A G20 Training Strategy. Op. cit.

43 ILO – CEDEFOP. Skills for Green Jobs: A Global View.

The active role of Ministries of Labour and Ministries of Education in harmonizing supply and demand.

- There is a full recognition of the responsibilities of the States and of their social partners in overcoming gaps between supply and demand in Ibero-America.
- In Spain and Portugal in particular, designing active labour market policies is essential, with subsidies for specific recruitment based on skill needs or unemployment duration, addressing the problems of young people and long-term unemployed persons.

The ILO (2008) has defined five broad areas of action:

to boost skills development at the workplace and along value chains;

to help manage global drivers of change;

to allow early identification of current and future skills needs to feed national and sectoral development strategies;

to link education, skills development, labour market entry and lifelong learning; and

to promote social inclusion by extending access to education and training for those who are disadvantaged in society. ILO, 2008.

- Educational institutions must ensure that supply matches the reality of work (present and future), contributing new knowledge and opportunities for research and innovation.
- Promote interaction between all stakeholders (education system and employers, for example), in order to address mutual needs, and develop awareness and opportunities for moving towards knowledge and innovation societies, and the development of talents' skills for the region's global competitiveness. (Manpower, 2013).

3 SENAI Prospective Model. Anticipating the demand of vocational training. SENAI, Brasil

3. SENAI Prospective Model. Anticipating the demand of vocational training. SENAI, Brasil

3.1 Foreword

During recent years, SENAI has developed and implemented SENAI Prospective Model in order to anticipate the demand of vocational training as a result of the productive system.

Given the potential of using said Model by other institutions, including some from other Latin American and Caribbean countries, SENAI, supported by ILO/Cinterfor has decided to transfer the main methodologies of the Model and register its main procedures.

This document is part of the effort made to systematize the knowledge acquired by the application of SENAI Prospective Model.

Rafael Lucchesi
General Director of Education and Technology
National Industry Confederation

3.2 Introduction

The need of vocational training institutions (VTIs) to anticipate the demand of training has increased during the last two decades as a consequence of productive restructuring and the world economy, which have rapidly modified the profile and amount of workers with more demanding, increasing and diversified skills.

The accelerated dissemination of new technologies and new forms of work organization in production, the restructuring of global productive chains, with the emergence and disappearance of important economic agents, are just some of the new features of the new productive configuration. The strategies to obtain comparative advantages based on low-cost labour and a high availability of raw materials are no longer sustainable within this context.

The new competitive strategy is based on the technological innovation process and it requires a differentiated quantitative analysis of jobs while it has significantly modified occupational profiles.

In general, this strategy requires occupational profiles that include skills that ensure a full use of the communication system, data interpretation, flexibility of activities, and integration with different levels of knowledge occupation, generation, familiarization and exchange. It is therefore considered that workers would be able to use their skills together with their personal characteristics and social and cultural backgrounds.

In a country such as Brazil, the qualifications demand is not only intense, heterogeneous and with different levels of complexity but it has also turned to require faster responses in the cases of productive plant relocations or new investments in regions which were not traditionally industrial and whose population has poor levels of schooling or knowledge of Portuguese and Maths.

Therefore, it is sometimes necessary to train a large number of workers in a short period of time on a complex profile of qualifications while students have serious deficiencies in Portuguese and Maths.

SENAI Prospective Model was developed after considering the time frame that goes between identifying the demand, transforming it into curricular design, preparing teaching materials, training teachers, investing in technology, training students and then themselves looking for a job in the labour market, while significant changes may have taken place in the demand that was considered as the initial parameter.

The objective of the Model is to anticipate the demand of vocational training in order to eliminate or reduce the lack of qualified workers, both in quantitative and qualitative terms. Therefore, given the fact that the lack of qualified employment may be caused because enterprises cannot find the necessary amount of qualified workers in the labour market or because the workers' knowledge does not match enterprises' requirements, SENAI Prospective Model was structured to answer two important questions: How many workers will be necessary in the near future and what will their necessary occupational profile be?

It took a long time to develop and implement SENAI Prospective Model and when it began being used by the institution it caught the attention of other entities that work in this area. Thanks to a technical cooperation agreement between SENAI and ILO/Cinterfor, nowadays a significant part of the Model is being applied in several countries of Latin America and the Caribbean; up to December, 2014, 19 countries have been involved.

This document includes this introduction, describes the background and evolution, the structure, the expansion and the main forms of use of SENAI Prospective Model. It concludes with a description of how it is applied by other countries.

3.3 Background and evolution

This chapter describes the evolution and current situation of SENAI Prospective Model.

a. Background

SENAI is an institution that caters for the demand of qualified workers of the Brazilian industry. It receives 1 percent of the payroll of all industrial companies of Brazil. Its training offer is organized according to the jobs within the industry that take into account the demand of qualified workers in different industrial sectors. Sometimes, the same occupation is intended for more than one industrial sector. Therefore the pace of its transformation may depend on the degree of cross-sectoral implication, the technological level and the speed of incorporation of the technical progress of the industrial sectors. Within this perspective, when addressing the demand of qualified workers of the industry, SENAI identifies and acts upon a medium need of qualification of each industrial job, depending on the degree of cross-sectoral implication of these occupations. The identification of training needs is done by means of studies, research and direct inquiries to enterprises of the industrial sector (Technical and Sectoral Committees) and, after a teaching-learning analysis, those needs are transformed into curricular designs, teaching materials and investment in new premises, educational technologies and teacher training.

Thus, the set of procedures used by SENAI to identify the current demand consist of developing curricula and teaching materials, training teachers and, depending on the course, investing in infrastructure (equipment, labs, rooms, premises, among other items). Only after this cycle, SENAI's operating units open vacancies, assess and register students, and then offer the course. The full cycle may take from 18 to 20 months. Once the course is over, the student looks for a vacancy within the labour market, for a period which may take from 6 to 10 months, depending on the economic situation of the sector and the region of the country, among other factors. The institutional format of these vocational training actions accounts for the adoption of these procedures, which were reasonable between the 1940s and 1980s when the incorporation of technical progress was relatively steady.

Furthermore, the resulting vocational training of this set of procedures is mainly translated into the transfer to the manufacturing sectors, industrial processes and working methods that are already consolidated, as well as mature technologies.

The accelerated dissemination of microelectronic-based technology and the advent of new forms of work organization in the 1980s have caused that the changes in the industrial jobs of Brazil occurred

more rapidly and enterprises required a vocational training that could encompass these changes more closely.

Simultaneously, in the 1990s, the decentralization process of the industrial process was speeded up and the qualifications demand for the industry was transferred to geographical regions, where some of the qualifications were not being addressed by SENAI schools.

In this way, what was appropriate for the dynamics of the previous time frame was no longer suitable for the previously described changes that had occurred in industrial plants.

During the 1980s and 1990s, SENAI implemented several changes to its procedures to adapt to the new needs of the productive sectors. The main aspects were: using different teaching strategies (for example, distance learning and mobile units), reducing training time and costs and shortening the period of time between the identification of a new training demand and the incorporation of students within the labour market; easing the training process with the design of professional planning. Even so, there was still a problem: the period of time from the implementation of the course to a student entering the labour market continued being too long, and there were structural difficulties to reduce it. Besides, it was still incompatible with the fast changes of industrial jobs. Therefore, companies kept facing increasing difficulties to hire qualified workforce and hiring SENAI students who were not familiar with new technologies and forms of work organization.

It was thus necessary to incorporate other procedures to SENAI's management that would enable the institution to anticipate vocational training demands of the industry, since this anticipation would allow for more time to prepare the offer. SENAI Prospective Model was therefore created as a way to respond to this need.

b. Evolution

In the 1990s, SENAI's National Department developed a set of tools that offered a better way to understand the changes that took place in the productive system and qualifications by creating the Observatory of the modifications of the Industrial Work and an Industrial Work Map and organized several seminars including national and international experts.

At the beginning of the year 2000, after an intense work together with IE/UFRJ (Economics Institute of the Federal University of Rio de Janeiro), PUC/Rio (Pontificia Universidad Católica of Rio de Janeiro) and Escuela Politécnica of the University of São Paulo, the first version of SENAI Prospective Model was developed with the purpose of answering the following questions: How many workers will be necessary in the near future, per sector, job and district? And what would their occupational profile be?

To answer the first question, it was necessary to develop a data model and the second question was answered through technological and organizational prospective.

The interaction between these two methodologies is the core of SENAI Prospective Model which will be later on described.

However, the way in which the future perspective is incorporated into the Model should be first analysed. Nowadays, the main role of VTIs is to train part of the economically active population for jobs that already exist by broadening their opportunities to enter the labour world. Therefore, VTIs must preferably train workers in jobs that are actually demanded by the productive sector. Besides, to establish a vocational training demand parameter, it is fundamental to know the demands of the production system. Given the fast transformations of the industrial work, it is possible that after receiving training and entering the labour market, the worker may soon face the introduction of new technologies or working methods for which he has not been trained.

Therefore, if the speed of dissemination of new technologies is taken into account, training may become obsolete since in some industrial sectors, where the technological dissemination is faster, jobs can become obsolete even faster. To minimize this situation, VTIs try to define the demand in a better way, broaden, soften and make plans of studies more general and academic, as well as to change teaching methodologies, and promote additional offers of new contents, among other strategies. Up to a certain extent, these solutions are adopted by VTIs and produce different results, with varied impacts on the costs and training effectiveness.

Within this context of fast changes, if VTIs increase the chances of a trained worker to face technologies and working methods in the labour environment that have already been learned during the training process, the learning impact for the worker and the enterprise would surely be enhanced.

The incorporation of the future perspective during the identification stage of the demand as a way of anticipating has become a relevant strategy, together with other strategies, including those mentioned before. Since the time frame between the identification of the demand and the worker's adaptation to the change and becoming part of the labour market can be quite long, if the observer at the time of identifying the demand could also look into the future with appropriate projecting and prospective tools, it is possible that he could identify technologies with a strong likelihood to spread in the near future that would change jobs in a substantial way, and thus include these technologies in all the stages of the training process.

This perspective is fundamental because VTIs mainly transfer mature technologies and working methods during training and labour insertion processes. Since these are disseminated among a high proportion of enterprises of a particular industrial sector or section, there tends to be an occupation-driven and skill-driven demand associated to them; therefore, the transfer would be probably demanded and the required investments in educational technologies for the training process have a low risk.

In a context of relative stability, VTIs work under the guiding principle of not creating a training offer for an occupation or skill that may not be much demanded or not demanded at all.

Within a context of rapid technological transformations, it is not enough to transfer only mature technologies into the training process given the speed of obsolescence of qualifications. Thus, it would be necessary to identify new technologies and working methods that should be transferred, to create mechanisms to identify them and incorporate them into the training process.

Some occupations and skills would only emerge in the next twenty years, according to the dissemination of radical innovations originating in the technological convergence between nanotechnology, biotechnology and microelectronics, while some governmental programmes of developed countries perceived the need of training in new skills that would emerge, facilitate or even contribute to the rise of these innovations.

Investments in education oriented to these areas can clearly have a higher risk than those oriented to mature technologies but their impacts can be much more significant in the long term. Undoubtedly, this is a challenge for VTIs of developing countries; thus it seems necessary to discuss the parameters in order to determine the allocation of resources in education and vocational training.

In the case of Brazil, the innovation process of industrial enterprises is essentially focused on the purchase of technologies. Thus, VTIs are mainly sought to create skills that offer sustainability to the uptake process of new technologies acquired by enterprises, and, to a lesser extent, to the demands arising from a production process of these new technologies or from a generation process of radical innovations.

To support this innovation strategy of Brazilian enterprises and the globalization context, SENAI considered that the most suitable solution for the technological transfer process was to create a training process based on mature and emerging technologies. Emerging technologies are not currently much spread and, at the same time, have a high potential to be disseminated around the productive system. The proportions in which mature and emerging technologies take part in the training and transfer processes vary among the occupations and depend on the speed in which new technologies are disseminated around the industrial sectors.

Taking into account this perspective and intrinsic restrictions of data design in order to extrapolate trends, SENAI Prospective Model estimates the amount of industrial workers that will be demanded in the near future.

The Model was designed to identify impacts in occupational profiles and changes in vocational training by using the dissemination rate of emerging technologies and a quantitative analysis of the demand. To analyse the impacts of occupational profiles, the key variable used by VTIs that enables to anticipate vocational training demands is the dissemination rate of emerging technologies, whose estimate enables to assess the changes of the occupational profile in the near future and, therefore, in vocational training.

In order to calculate these estimates, SENAI Prospective Model gathers a set of projection and prospection methodologies that enable, in a fast and objective way, to generate information that may respond the two queries determined for vocational education managers: How many workers will be needed in the near future and what occupational profile will they have? SENAI Prospective Model is described in the following chapter.

3.4 Structure

SENAI Prospective Model is structured according to the following stages:

a) Estimated number of workers

b) Technological and organizational prospective

c) Identification of probable occupation profile changes.

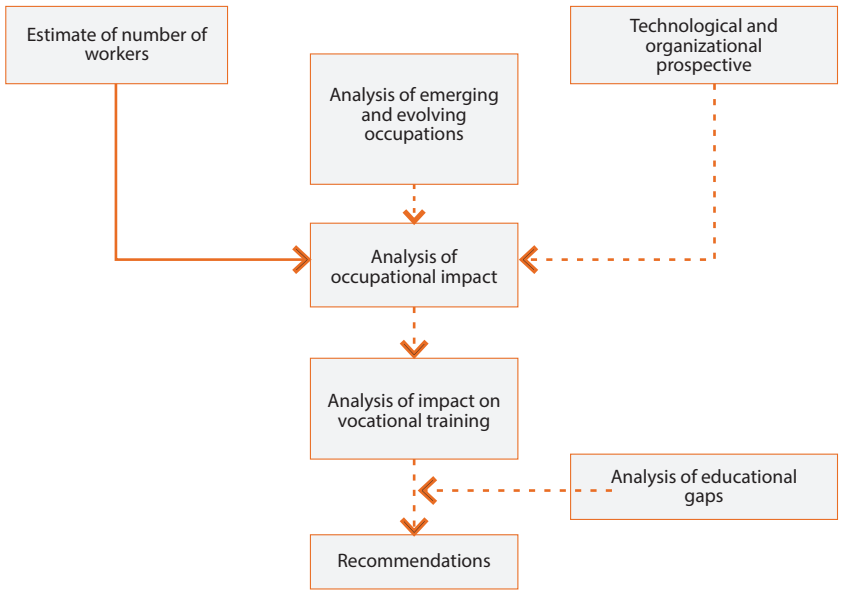
d) Identification of probable changes in the supply of vocational education

e) Recommendations (Thematic Antenna)

f) Monitoring

Figure 1 (below) provides a graphic representation of the flow of activities in the Model aiming to identify future vocational training demands.

Figure 1 – General layout of SENAI Prospective Model



The main idea is to evaluate the impact on industry jobs from the estimated number of workers needed in the near future and the technological and organizational prospective. The following step is to estimate the impact on vocational training. As we have a set of estimates, and though we have adopted a criterion of greater frequency to select emerging technologies, many of the decisions are made after the follow-up stage, which begins right after the Thematic Antenna.

a. Estimation of number of workers

The number of jobs to be created in the industry in the following five years is fundamental to describe the training demands. To estimate the number of jobs in the different sectors of the economy, SENAI Prospective Model resorts to a model that estimates, for the projected years, the variation in the final demand throughout the economy and its sectors using the Brazilian economy's interregional input-output matrix. Subsequently, this variation in the final demand becomes a variation in employment and is distributed among all sectors of the economy.

An occupational matrix is then used to estimate the number of jobs per sector, thus reaching all Brazilian occupations, sectors and municipalities. These estimates make up the Industrial Work Map, a tool which is frequently used in the National Department and in the Regional Departments of SENAI.

b. Technological and organizational prospective

Technological and organizational changes are fundamental to explain changes in occupational profiles. SENAI Prospective Model detects the possible technological and organizational changes from the technological and organizational prospective. This prospective is analysed within the dynamics of industrial sectors, as their behaviour depends on the nature of sectoral involvement.

The technological and organizational prospective was created to prospect the future for a 5-10-year time horizon, as although there is a high level of uncertainty in such time frame, it remains acceptable. Additionally, it is the most suitable term to estimate the percentage of dissemination of specific emerging technologies and new forms of work organization in production.

Emerging technologies include developing innovations – that are pre-commercial or have been recently launched into the market – or those with a low dissemination level, independently of how long they have been on the market. The degree of dissemination is of up to 70 percent of the user market in a time frame of between 5 to 10 years. The term specific refers to the fact that they belong to or are broadly used in a given sector of the economy.

Emerging technologies and new forms of work organization in production and the corresponding dissemination percentages are identified by gathering groups of experts from SENAI, businesses and universities in the various stages of the Model.

The main result of the technological and organizational prospective is the dissemination percentages of specific emerging technologies and new forms of work organization in production in each sector of the economy.

c. Analysis of emerging or evolving occupations

A study was conducted in order to broaden the view of the global situation regarding restructuring processes. The purpose of the study was to identify sectoral occupational changes in certain countries, classifying them as emerging or evolving occupations [Bureau of Labour Statistics (BLS) of the United States of America].

The methodology used is based on mapping and analysing data gathered through general and occupational sectoral studies conducted in Brazil and other countries. After these studies, various experts from SENAI, enterprises and universities were consulted to evaluate and validate the data collected from the aforementioned analysis, and to adapt the information to the reality of the Brazilian industry sector.

As a result, at this stage it is possible to identify a number of possible new activities and skills, a reduction in the need to have other activities and skills, as well as occupational changes.

d. Identification of probable occupation profile changes

The stage of identifying the probable occupation profile changes goes beyond the estimation of the number of workers and the technological and organizational prospective. Its aim is to identify and evaluate probable occupation profile changes caused by the introduction of specific emerging technologies and the organization changes identified.

The appreciation of the number of workers may point to the fact that, in the sector under study, some occupations will increase or decrease in the period analysed, and this information must be studied. The technological and organizational prospective marks the appearance or reduction of the importance of what workers do in their occupation, and even in different occupations.

e. Identification of educational gaps

When we analysed the school performance of primary and secondary education children since the 1990s – when systematic evaluation was first implemented in Brazil through standardised tests –, we noticed that student performance was persistently low. This low performance has a strong impact on SENAI training activities, especially vocational training for jobs with a strong technological component that require greater abstract thinking.

As new technologies use ever-developing software to ensure their functionalities, those who operate them are required to show greater abstract thinking. These two trends (low school performance and technological changes) make VTIs work very hard so that these students take part in courses that include new technologies.

Therefore, SENAI Prospective Model also considered Portuguese and Maths deficiencies (educational gap) to anticipate the effort the institution would have to make to cater for students with such deficiencies. These gaps in education are identified by means of a comparative analysis of students' skill levels in Portuguese and Maths for students that come from mainstream education and the knowledge requirements in these disciplines according to the new occupational profiles required.

f. Identification of probable changes in the supply of vocational education

Changes in vocational education are identified by establishing new knowledge, skill and attitude standards, which can jointly generate new vocational competencies in such a way that VTIs can adapt their education supply.

The person in charge of implementing SENAI Prospective Model reviews all the material created in previous stages. Then, jointly with the internal experts that have participated from the start of the implementation, they build a preliminary view of what needs to be changed in the supply of vocational training so as to adapt to technological and organizational changes and changes in the occupational profiles identified. This preliminary view is then submitted to the Thematic Antenna for discussion, which is the next and final stage of SENAI Prospective Model.

g. Recommendations (Thematic Antenna)

The Thematic Antenna is the final stage of SENAI Prospective Model. It is here that the preliminary results obtained in the previous stage regarding changes in vocational education are discussed, as well as all the results obtained in previous cycles. As this information comes from probable events in a relatively short term, events regarding changes in the number of jobs, in technological and organizational dissemination and in occupational profiles, SENAI Prospective Model reduces the degree of uncertainty regarding the supply of vocational training.

As uncertainty is reduced, the Recommendations made at this stage pose a lower financial and operational risk for decision-makers. These Recommendations, jointly with a large volume of data, are submitted to SENAI's Sectoral Technical Committees so that they can be discussed and their relevance considered for the curriculum of a given course. This is how the first stage of the SENAI's vocational training institutional process is completed.

h. Monitoring

For any of the methodologies used when studying the future it is necessary to monitor the main variables that supported the conclusions, in this case the Recommendations. The result of this monitoring must be made available to decision-makers and users of the information obtained from the application of the Model.

The number of jobs estimated through the matrix is monitored on a monthly basis, and newsletters and reports are written. Specific emerging technologies are monitored using a special methodology: visits to the main suppliers of emerging technologies who exhibit their products in specialised fairs.

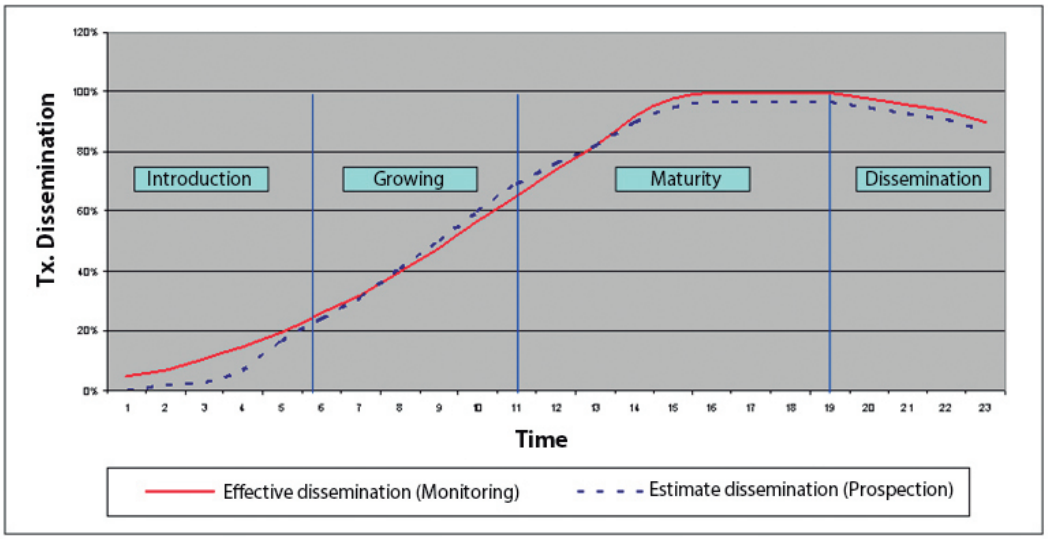
In addition to searching for more information to ease the uncertainty of decision-makers regarding the evolution and maturity of emerging technologies, SENAI experts who visit specialised fairs also look for other possible technological trends which were identified in the Model, or not, or that are new in the country. This monitoring allows for a systematic follow-up process for the technological dynamics of each sector under study.

The degree of technological dissemination is monitored via surveys and meetings with enterprises within the sectors analysed. Surveys are designed to verify the extent to which emerging technologies are used. In meetings we try to evaluate that emerging technologies are used effectively together with the enterprises that are potential users. These meetings are called Technological Dissemination SENAI Workshops.

Decision-makers are provided with the data collected when monitoring the number of jobs, emerging technologies and percentage of dissemination. In this way they can adapt their action plans to changes in context.

From this degree of technological dissemination we can draw an effective curve to represent technological dissemination, as shown in the following chart.

Chart 1: Curve of technological dissemination



Source: UNIEPRO/DIRET

The dissemination of new technologies depends on many factors: it can be disseminated or not, since the way in which enterprises perceive technology has a strong impact on its dissemination. Technology can be understood in a much more complex way, or it can be seen as not having clear advantages over the technology it might be replacing. There can be other similar technologies or there could be a more competitive technology. Distribution channels may be needed or technology could also depend on investments in infrastructure for its dissemination. People may believe that there is a lack of skilled labour to interact with the technology, among other factors.

Therefore, the process of technological dissemination needs to be divided into different stages: the aim is to reduce investment-related uncertainties. From a theoretical point of view, the dissemination path of new technology can be divided into four stages: introduction, growth, maturity and decline, as shown in Chart 1. This path is a result of the behaviour of the dissemination percentage through the years. It usually shows a reduced rate of users in the initial phase of dissemination, which then increases gradually in the growth stage until it reaches the highest level of dissemination at the maturity stage, when it declines again.

Chart 1 shows the S curves of estimated technological dissemination (technological prospective) and effective technological dissemination (research or workshop). Based on that result, a specific enterprise (that has participated in the dissemination workshop) can verify its position compared to that of its competitors,

and a VTI can make better decisions regarding the type of investment in education technology that should be made (see item on main applications).

The main outputs of the monitoring activities: to generate data to connect what was projected or prospected with what is actually happening, and to communicate these data to decision-makers; to create subsidies to conduct new prospective studies.

3.5 Expansion

The main methodological changes that expanded the reach of SENAI Prospective Model were the introduction of scenario methodology and the design of technology roadmapping.

a. Sectoral scenarios

SENAI Prospective Model introduced the prospective scenarios methodology to reduce uncertainty even further in very unstable contexts. The implemented methodology considers four possible scenarios, each one placing the country and the sector in unfavourable and favourable future situations regarding economic growth and political and social contexts.

The technological and organizational prospective of each analysed industrial sector considers the type of emerging technology most likely to be disseminated in each one of the four scenarios, so as to have a wider view of all the possibilities.

After completing all the stages and writing the Recommendations, the monitoring is conducted to show decision-makers the multiple dimensions of each scenario, so as to provide the person in charge with information that is more reliable.

b. Technology roadmapping

Technology roadmapping is a tool that identifies, evaluates and selects technological alternatives and graphically represents the evolution of current technologies, products and markets (today) and which will be built (future). The main purpose of technology roadmapping is to generate data to reduce fluctuations in the decision-making process for technological investment.

SENAI Prospective Model incorporated technology roadmapping to broaden prospection possibilities for technical and technological services and for research and development actions taken by SENAI Institutes for Innovation and for Technology. Additionally, a complete knowledge database is built when analysing patents and scientific articles relative to a specific industrial sector. This database facilitates a wider identification of emerging technologies that will be used in the technological prospection.

3.6 Main forms of use

The main aspect regarding the use of the results of SENAI Prospective Model is the type of decision that can be taken to anticipate the demands of skilled workers. A few current applications are presented from the assumption that SENAI Prospective Model reduces the uncertainty level of decision-makers.

a. Occupational profiles

The main application of SENAI Prospective Model is the introduction of profile changes in the definition of occupational profiles as a consequence of the dissemination of specific emerging technologies and of new forms of work organization in production. This reduces the term of obsolescence of certain qualifications, and after completing training, workers are better prepared to interact with new technologies.

b. Identification of growing occupations and occupations in decline

Employment growth or reduction estimates are compared to technological dissemination; the occupations which will sustain the greatest impact from this dissemination (reduction) and which will be boosted by such dissemination (growth) are identified.

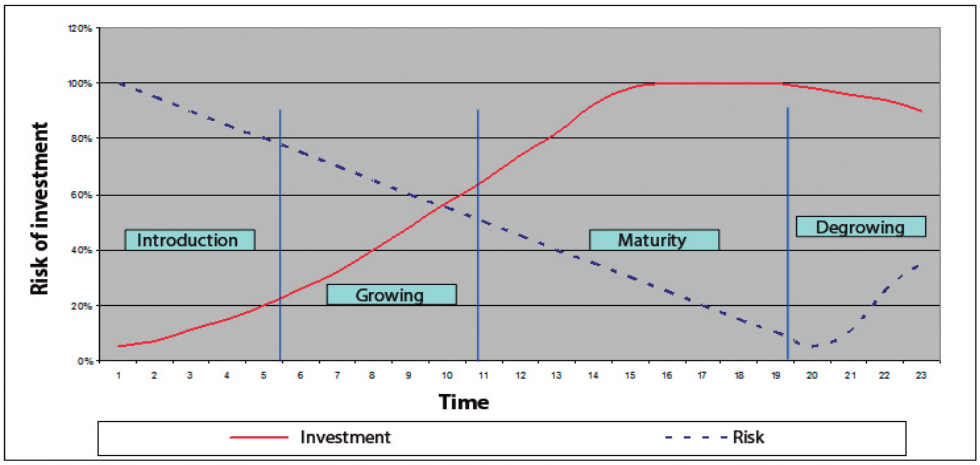
This information is relevant to structure retraining programmes for workers that are transferred due to the dissemination of prospected technologies. It is also relevant to develop training programmes for workers needed for new activities resulting from technological dissemination.

c. Technological update of VTIs

When VTIs have information about the emergence of a new technology and its likely consequences on occupational profiles, they can make decisions related to investment in educational technologies and teacher training. The risk entailed by this kind of technological investment is connected to the future behaviour of a given technology, as at the beginning of the path (introduction), the risk is greater, and then it decreases as the technology moves toward the maturity stage, to then grow again in the decline stage (chart 2). This may be the case because new technology that starts its dissemination process (introduction stage) may not disseminate at all (i.e. does not progress to other stages) as people need to clearly understand its benefits or even the need for new infrastructure and changes in the organization. There are small risks associated to the different strategies of technological update, considering investment costs (costs of acquisition, installing, updating and maintenance) and the risk associated to the dissemination stages of the emerging technology.

Chart 2 shows an ideal investment curve (in red) for a VTI. There is a negative correlation with the risk curve, that is to say, the smaller the risk, the greater the investment. VTIs run the risk of investing in a new technology at the introduction stage that then does not reach the dissemination stages. The following technological update strategies, which should be evaluated for each dissemination stage of emerging technologies, can be highlighted: the institution itself develops and produces resources, software, games and teaching simulators; the institution purchases software, games and teaching simulators; there are stronger national and international alliances to renew the technological base in commodatum or by donation; introduction of technological improvements to equipment (retrofitting and modernisation); acquisition of machinery and equipment; reallocation of equipment among different vocational training units. Besides, nowadays there are many successful experiences in VTIs around the world which use technologies in on-the-job training activities.

Chart 2: Risk and investment associated to technological dissemination stages



Source: UNIEPRO/DIRET

The strategies for teacher training, one of the most important stages in the technological update process can be varied in nature, as they are governed by indicators that show the technological and organization dynamics, verified by the position of the dissemination rate of emerging technologies and of the cost and effectiveness of each strategy. Some of those strategies can be: distance education, workshops on emerging technologies; printed materials, software; suppliers' statements; attending national and international fairs; hiring experts to train teachers.

d. Boosting technological dissemination

Another application of the results of SENAI Prospective Model is the induction of the dissemination of emerging technologies, so that the vocational training institution not only adapts to the demand, but also modifies it.

If it is known that a specific emerging technology is very likely to disseminate in the industrial sector, the VTI can present and discuss that technological information with business people that belong to the sector.

Technological information is a major dissemination factor, since not all business people have reliable sources of information. SENAI organizes Technological Dissemination SENAI Workshops which, besides disseminating information on specific emerging technologies for business people, also makes use of meetings with enterprises to collect information on how business people use new technologies, so as to generate a crucial indicator of the effective dissemination of those technologies (monitoring).

These actions will also enable VTIs to act as "induction" agents in the dissemination of new technologies, through activities to reduce uncertainty among production flow representatives at the specific emerging technologies acquisition stage.

3.7 Application by other countries

There are some features of the industrialization process of countries of Latin America and the Caribbean which are quite similar, particularly, the technological innovation strategy based mainly on the acquisition of devices and equipment.

Therefore, some industrial sectors of the region show a significant technological heterogeneity among its enterprises, and thus, a particular technology may have been in the market for a long time but with a low dissemination rate.

SENAI and ILO/Cinterfor have entered into a Cooperation agreement to transfer part of SENAI Prospective Model to the countries of the region and, from 2012 and 2014 twenty two countries received training and applied the methodology to their own contexts.

a. Transferred stages of SENAI Prospective Model

To start the transfer process of the Model towards Latin American and the Caribbean countries, the following activities and tools were chosen to be transferred: technological prospective, occupational impact analysis and recommendations.

The selection of these activities and tools was based on the fact that they were the core elements of the Model and that they could be carried out by the institutions of those countries.

b. Inter-American Prospective Network

The methodological transfer task was supported by ILO/Cinterfor which created a virtual platform to facilitate the training process of teams by SENAI's team.

During such transfer, the Inter-American Prospective Network was created, including almost 100 experts in technological prospective applied to VTIs in Latin America and the Caribbean.

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4.1 Introduction

Jamaica is the third largest island in the Caribbean, with an area of approximately 11,000 square km, and a population of approximately 2.7 million people (Statin, 2014). The Country recorded a gross value added of $732,248 million in 2013, which is equivalent to a 0.2% increase from the previous year (Statin, 2014). The economy is largely dependent on the Services Industry, which accounts for approximately 80% of GDP in 2013 (PIOJ, 2014).

The Jamaican economy has suffered negative shocks since the global economic downturn. This downturn also resulted in a further increase in the Country's public debt, which was estimated to be 139% in 2013 (Miller, 2014). Amidst the economic downturn, Tourism continues to be a significant foreign currency earner for the Country, and is one of the Country's leading industries.

4.1.1 Vision 2030 – tourism sector plan, goals and objectives

The Vision 2030 Tourism Sector Plan has established five guiding goals as presented in Figure 1 that would steer the activities of the Industry in a focused direction for achieving its own vision for: "An inclusive, world-class, distinctly Jamaican Tourism Sector that is a major contributor to socio-economic and cultural development, with a well-educated, highly skilled and motivated workforce at all levels within a safe, secure and sustainably managed environment".

Figure 1: Tourism sector goals

In keeping with the United Nations World Tourism Organization (UNWTO) recommendations, the Vision 2030 Tourism Sector Plan has maintained training as a key element of the Sector's vision and goals. The HEART Trust/National Training Agency (HEART Trust/NTA) has been identified in the plan as the agency responsible for a range of training for the tourism workforce.

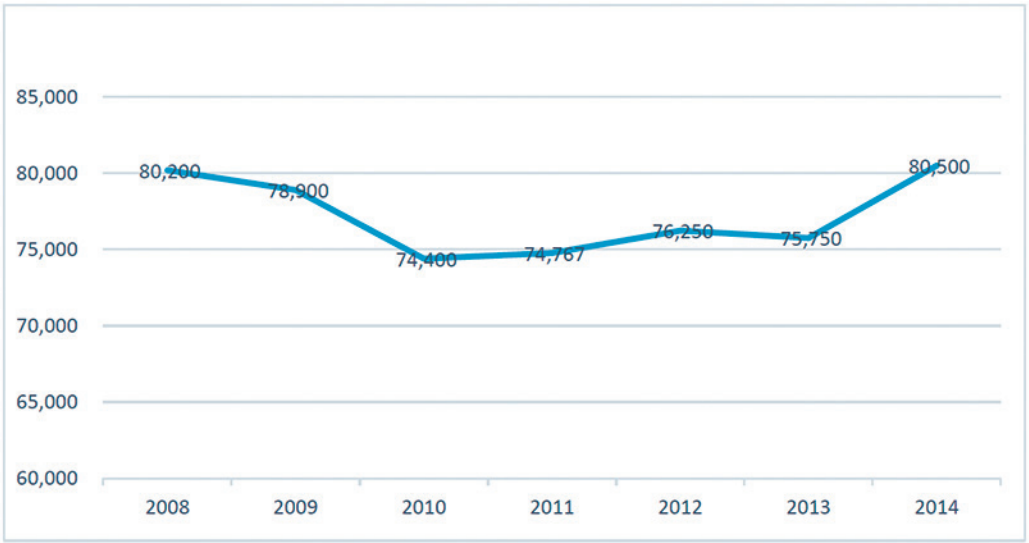
The Jamaican Tourism Industry is structured around eight sub-industries, based on the Caribbean Tourism Organization's classification of the Industry, with both private and public sector players. This includes hotel and restaurants services, which is the focal point of this study.

4.1.2 Trends in the hotels and restaurants services industry

The Hotels and Restaurants Services Industry in Jamaica continues to expand with the construction of new hotels, namely the RIU Palace, which opened in the last quarter of 2013 and the Country Marriot, which is set to begin construction in 2015. Several hotels in the Industry also underwent or are currently refurbishing and/or rebranding. As a result, the Industry now boasts several international brands. The Country recently embarked on formalizing Community Tourism, which aims to offer visitors the opportunity to explore Jamaica safely, to visit village communities, and to enjoy meeting its citizens in their own communities, while conserving the national heritage, protecting the environment and contributing to an improvement in the quality of life in local communities (JTB, n.d).

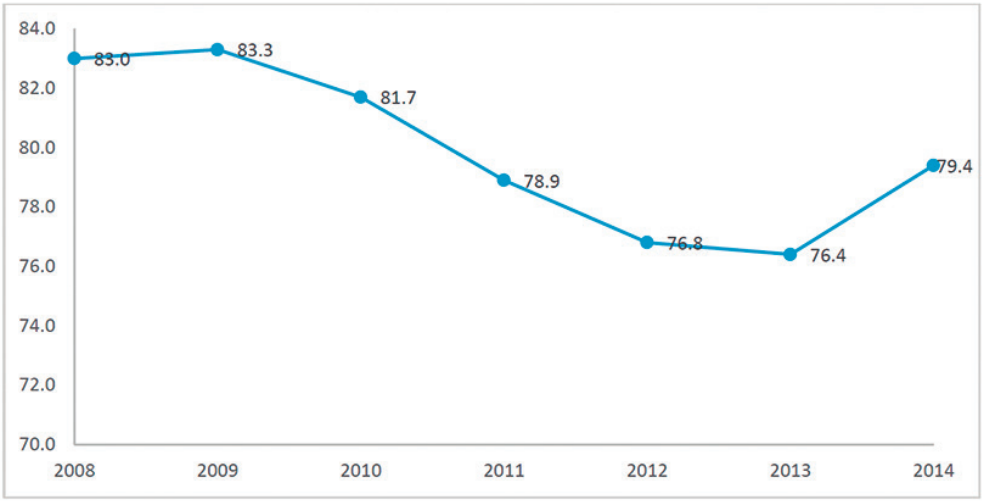
The Industry benefits all its citizens in one way or another. Data in 2014 from the Statistical Institute of Jamaica (STATIN) shows that the Hotel and Restaurant Services Industry accounted for 80,500 jobs, which represented approximately 7% of total employment. This represented a movement from 80,200 jobs in 2008 or a growth rate of approximately 0.4% (Figure 2).

Figure 2: Employment within the hotel and restaurants services industry



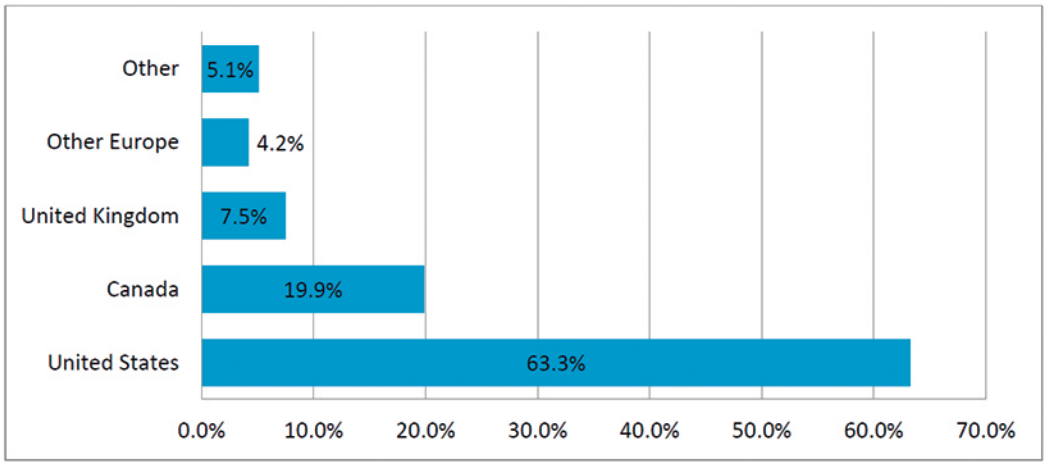
As at 2014, the employment rate in the Hotels and Restaurants Services Industry stood at 79.4%. This was an increase over the previous year, when the Industry's employment rate was 76.4% (Figure 3).

Figure 3: Rates of employment within the hotels and restaurants services industry



In 2013, preliminary data shows that total visitor stop-overs was 2,008,409, which represented a 1.1% increase from 2012. This was mainly due to increased arrivals from the USA and Europe, as well as the introduction of flights from Russia and the Czech Republic. With a share of 63.3%, visitors from the United States continue to account for the greatest share of stop-overs. Visitors from Canada and the United Kingdom accounted for the second and third largest shares with a representation of 19.9% and 7.5%, respectively (Figure 4). On a similar note, total visitor arrivals amounted to a record high of 3,273,677. From this total, foreign nationals, cruise passengers and non-resident Jamaicans represented 57%, 39% and 4%, respectively.

Figure 4: Share of Stop-Over Arrivals



Total visitors' expenditure amounted to US$2.113 billion; representing a 2.1% increase from 2012. Total stopover visitors expenditure was approximately 95% of total expenditure, while, cruise passenger expenditure was estimated to be approximately 5% of total expenditure (JTB, 2014).

4.1.3 Information and communication technology's role in hotels and restaurants. Services Industry

Hotels and Restaurants Services is a highly information-intensive industry; as such the use of information and communication technology (ICT) will have a great impact on its products and services. This is so, as ICT provides new tools and enables new distribution channels, thus creating a new business environment. The application of ICT in the Industry has also empowered potential consumers and as a result continues to drive significant changes within the Industry, especially in the areas of planning, marketing, promotions and monitoring of destination offerings.

This is evident where through the use of ICT, a vast number of tools can be used to facilitate bookings and information search, for instance virtual (3D) representation of the destination and mobile applications may enable tourists to find products or services that match their needs.

Nevertheless, the human element of the Industry is very important, as it promotes the interfacing among different people. As such, the HEART/Trust NTA in collaboration with the International Labour Organization (ILO), the Association of Caribbean States (ACS) and SENAI deemed it necessary to conduct a tourism foresight study that focuses on the emerging technologies that will impact the Tourism Industry in Jamaica and more specifically the training environment.

4.1.4 Statement of purpose

The main focus of this Study is to examine the future impact of emerging technologies on the Hotels and Restaurants Services Industry. As such, the main objectives of the study were to:

- Identify emerging technological innovations that will have an impact on the Hotels and Restaurants Services Industry in 2015 and beyond.
- Identify the current and future occupational areas that will be impacted by the emergence of these technological innovations in the Industry.
- Identify the new skill sets that will be required to perform each occupation effectively.

4.1.5 Methodology

To ascertain the objectives of this study, a combination of primary and secondary research methods were used.

I Primary research

The Delphi Technique was the main methodology used for this study; it involved the administering of a pre-designed questionnaire to industry experts, followed by the incorporation of two focus group sessions. A list of key industry experts was created and representatives were invited by telephone and email. The experts were selected from various parts of the sector including government agencies, hotels, restaurants and tertiary institutions. At the meeting, the panel of experts was further introduced to the DELPHI methodology.

The Delphi Technique is a forecasting method, which seeks to aggregate opinions from a diverse set of experts, which can be accomplished without everyone being present at the same time for a physical meeting. Multiple rounds of questions are asked and experts are allowed to adjust their answers in subsequent rounds as each member of the panel is told what the group thinks as a whole. In other words, the Delphi method seeks to reach the "correct" response through consensus.

I Secondary research

Secondary data was garnered through a series of desk research including industry reports, publications and newspaper articles. In addition, a comprehensive review was done on the thirty- five listed emerging technologies as provided by the ILO/SENAI in their guiding documents.

4.1.6 Research limitation

The main limitation of this study is the low participation of industry experts. This however, had only a minimal impact, as the overall quality of the Study was not severely affected. This was due to the knowledge of the experts about the technologies discussed at the sessions held.

4.2 Emerging technologies most likely to impact the industry over the next five to ten years

The initial selection of emerging technologies that are expected to have an impact on the Hotels and Restaurants Services Industry in Jamaica was based on a list provided by SENAI Prospective Model. The technologies identified are presented in Table 1.

Table 1: Technologies Expected to Impact the Hotels and Restaurants Services Industry: 2015 and Beyond

ASP-based IT applications	Natural Disaster prevention
Automatic hotel check-in and check-out systems	New laundry and dishwashing systems
Comprehensive corporate management software	Non-polluting transport models
CRM customer service systems	Peripheral terminal services
Electronic booths	Personalized electronic guides
Electronic forfeits (Payment system)	Satellite-enabled environmental management
Electronic service cards	Smart labels for containers
Energy saving micro-systems	SME Industrial Equipment
Equipment and systems to improve accessibility for disabled persons	State-of-the art electronic translation devices
Fifth-range food products	Supply replenishing micro-systems
Food hygiene control systems	Sustainable Buildings
Geo-marketing applications	Sustainable management of tourist resources
Global booking systems	Telecommunication protection
HPS systems and devices	Telecommunications integration
Local communication systems and equipment in hotel and tourist enterprises	Telephone IT systems for data transmission via the internet
Mobile telephone services	Thalassotherapy26 equipment for hotels
Modular and versatile construction systems	Tourist promotion virtual reality systems
Multi-protective construction elements	

4.2.1 Technologies used in the study and associated impacts

From the list of thirty-five emerging technologies, nine (9) were identified by industry experts to be adopted extensively in the Hotels and Restaurants Services Industry in the medium to short term. These were:

- Electronic booths
- New laundry and dishwashing systems
- Tourist promotion virtual reality systems
- Geo-marketing applications
- Natural disaster prevention
- Fifth-range foods

- State-of-the art electronic translation devices
- Sustainable buildings
- Smart label containers and
- Food hygiene control

If these technologies diffuse at the rate of expectation, the Hotels and Restaurants Services Industry is set to reap tremendous benefits, as this will not only yield to the increase of the cadre of tourists that visits the Country, but also the products and services offered. Notably, these technologies also allow for green or sustainable Tourism products.

4.2.2 Possible occupations to be impacted

The following represents a list of directly linked occupational areas identified within the Hotels and Restaurants Services Industry. This was used to aid in classifying occupations that may be impacted by the ten dominant technologies identified:

- Baker
- Bartender
- Bellhop
- Chef
- Customer service/Front office
- agent
- Entertainment coordinator
- Events planner
- Hostess
- Housekeepers
- Managers
- Marketing specialist
- Massage therapist
- Night auditor
- Spa therapist
- Tour guide
- Waiters/Waitress
- Water sports coordinator
- Water sports equipment
- Maintenance
- Water sports manager

I Occupations most likely to be impacted by the emerging technologies

Findings show that from the list of occupations previously identified, the following five (5) occupational areas will be most impacted by the emerging technologies as identified in section 2.1 and their related skill gaps.

Table 2: Occupational Areas most likely to be Impacted and Associated Skill Gaps

Occupations	Skill Gaps
Chef	• Food styling • Preparation of Fifth Range Food • Recipe writing for fifth range dishes • Extensive HACCP Training • Knowledge of Food Hygiene Control Systems
Customer Service/Front Office Representative	• Foreign Language (Spanish, French, Dutch, Russian, Japanese and Mandarin) • Use of and troubleshooting Electronic Booths • Use of Tourist Promotion Virtual Reality System • Knowledge of and troubleshooting electronic translation devices.
Environmentalist	• Knowledge of Sustainable Buildings • Greening Hotel • Impact of Thalasso-Therapy Equipment on the environment
Marketing Specialist	• Use of Geographic Information Software (GIS) • Geo Marketing Analysis • Geo- Targeting • Presenting Spatial Data • Data Mining
Tourism Manager	• Knowledge of and troubleshooting electronic translation devices • Foreign Language (Spanish, French, Dutch, Russian, Japanese and Mandarin) • Knowledge of Fifth Range Foods • Knowledge of Food Hygiene Control System • Use of and troubleshooting Electronic Booths • Geo-Marketing Analysis

These occupations were most likely to be impacted by the following technologies as shown in Table 3:

Table 3: Emerging technologies and degree of occupational impact

		Degree of Impact on Occupational Areas Most Impacted									
		Chef		Tourism Manager		Customer Service/Front Officer		Marketing Specialist		Environmentalist	
	Specific Emerging Technologies	Low impact	High impact	Low impact	High impact	Low impact	High impact	Low impact	High impact	Low impact	High impact
1	Electronic Booths	x			x		x		x	x	
2	Thalasso-Therapy Equipment	x			x	x		x			x
3	Geomarketing Applications	x			x	x			x	x	
4	Tourist Promotion Virtual Reality Systems	x			x		x		x	x	
5	Fifth Range Foods		x	x		x		x		x	
6	Sustainable Buildings	x			x	x		x			x
7	Smart Label Containers		x	x		x		x			x
8	New Laundry and Dishwashing Systems	x		x		x		x		x	
9	Food Hygiene Control Systems		x	x		x		x		x	
10	State-of-the-art Electronic Translation Devices	x			x		x	x		x	

The findings also show that the following occupational areas should emerge given the impact of the major technologies identified:

- Interface manager - Interfaces are the functional and physical connections at the boundaries of ICT systems that are designed to interoperate with other systems. There are many types of interfaces, including communications, signalling, services, data, hardware, software, application program, among others.
- Food stylist – The role of the Food Stylist is to make food look attractive in photographs. Visual know how is also a requirement, as is the knowledge of how to translate the perception of taste, aroma and appeal from an actual dish, to a two- dimensional photograph.

  Food stylists have culinary training; and some are professional Chefs. As creative professionals, they envision the finished photograph and style the food.

  Food Technologist - Food Technologists make sure food products are produced safely, legally and are of the quality claimed. They can be involved in developing the manufacturing processes and recipes of food and drink products and may work on existing and newly discovered ingredients to invent new recipes and concepts.

  Food Technologists modify foods to create products such as fat-free items and ready meals. They often work closely with the product development teams to help deliver factory ready recipes based on the development of kitchen samples.

4.3 Contextualization and recommendation

The Hotels and Restaurants Services Industry in Jamaica is poised to experience growth and expansion in the services offered to its visitors and citizens. The Industry is one that is highly information-intensive, and as such the use of information and communication technology will have a great impact on its products and services. Notably, ICT provides new tools and enables new distribution channels, thus creating new business environments. The application of ICT in the Industry has also empowered potential consumers and as a result continues to drive significant changes within the Industry, especially in the areas of planning, marketing, promotions and monitoring of destination offerings.

In light of the projected direction to be taken by the Industry and the impacting technologies, it is seen where operations will mainly be impacted in the areas of cuisine, telecommunication and marketing. These areas will be mainly impacted by the following technologies:

- Fifth-Range food
- Thalasso-therapy equipment
- Geomarketing applications
- Mobile telephone services
- Sustainable management of tourism resources

Specifically, the occupational areas to be impacted are:

- Chef
- Customer service/front office representative
- Environmentalist
- Marketing specialist
- Tourism manager

The further advance the Industry, it is recommended that the following steps be undertaken to assure that the Industry realizes its fullest potential.

1. Given the projected technological diffusion in the Hotels and Restaurants Services Industry, it is recommended that occupational standards, qualification plans and curricula be revised to treat with the occupational areas and skill gaps identified as follows:

Occupation Impacted	***Skill Gaps***
Chef	• Food styling • Preparation of Fifth Range Food • Recipe writing for fifth range dishes • Extensive HACCP Training • Knowledge of Food Hygiene Control Systems
Customer Service Representative/ Front Desk Representative	• Foreign Language (Spanish, French, Dutch, Russian, Japanese and Mandarin) • Use of and troubleshooting Electronic Booths • Use of Tourist Promotion Virtual Reality System • Knowledge of and troubleshooting electronic translation devices.
Environmentalist	• Knowledge of Sustainable Buildings • Greening Hotel • Impact of Thalasso-Therapy Equipment on the environment
Marketing Specialist	• Use of Geographic Information Software (GIS) • Geo Marketing Analysis • Geo- Targeting • Presenting Spatial Data • Data Mining

Tourism Manager	• Knowledge of and troubleshooting electronic translation devices • Foreign Language (Spanish, French, Dutch, Russian, Japanese and Mandarin) • Knowledge of Fifth Range Foods • Knowledge of Food Hygiene Control System • Use of and troubleshooting Electronic Booths • Geo-Marketing Analysis

2. Workforce development training should be provided for Chefs, Customer Service Representatives/ Front Desk Representatives, Environmentalist, Marketing Specialist and Tourism Managers, who are currently working in the Industry to treat with the skill gaps previously identified.

3. Occupational standards, qualification plans and curricula should be developed to treat with the following occupational areas that are expected to emerge, given the projected impact of the technologies utilized in the Study:

- Food Technologists
- Food Stylists
- Interface Managers

APPENDIX 1

Participating experts

This activity used a panel of experts from the Tourism and Hospitality Industry in Jamaica. The following are the representatives and their institutions:

Representative	Institution
Peter Mullings	Jamaica Tourist Board
Marshalee Johnson Spencer	Jamaica Tourist Board
Gail Barrett	Jamaica Promotions
Carol Straw	Jamaica Promotions
Kimberly Trowers	Ministry of Investment, Industry and Commerce
Marsha Grant	Cardiff Hotel and Spa
Althea Denise Gordon	University of Technology
Carla Gordon	National Environment and Planning Agency

Staff from The HEART Trust/National Training Agency are as follows:

Allison Birch	Director, Labour Market Research & Intelligence Department
Kacia Hanson	Manager, Labour Market Research
Dahlia McLeod	Labour Market Specialist

APPENDIX 2

Training providers and programmes offered

PROGRAMMES	INSTITUTIONS
Bakery Chef Level 1 CFP (Cookery) Commercial Food Preparation Level 1 CFP (Portering) Commercial Food Preparation Level 1 Community Cookery Level 1 Community Tourism Level 1 F&B Bar Service (Portering) Food And Beverage Level 1 F&B Restaurant Service (Server) Food And Beverage Level 1 House-keeping - (Houseman) Level 1 Housekeeping - (Room Attendant) Level 1 Housekeeping (Laundry Attendant) Level 1 Bakery Chef Level 2 CFP (Cake Baking & Decorating) Commercial Food Preparation Level 2 CFP(Commis Chef) Commercial Food Preparation Level 2 Community Tourism Level 2 F&B Bar Service (Bartending) Food And Beverage Level 2 F&B Restaurant Service (Captain) Food And Beverage Level 2 F&B Restaurant Service (Hosting) Food & Beverage Service Level 2 Front Office - (Concierge Agent) Level 2 Front Office - Front Office Agent Level 2 Hospitality Services - (Villa And Other Properties) Level 2 Housekeeping (Linen Room Attendant) Level 2 Tourism – (Tour Guiding) Level 2 CFP (Chef De Partie) Commercial Food Preparation Level 3 CFP (Pastry Chef / Patisserie) Commercial Food Preparation Level 3 CFP (Sous Chef) Commercial Food Preparation Level 3 Events Planning & Management (Events Supervision) Level 3 F&B (Maitre'D) Food And Beverage Supervision Level 3 Front Office (Front Office Supervision) Level 3 Hospitality Operations Level 3 Housekeeping (Housekeeping Supervision) Level 3 Tourism – (Tour Guiding) Level 3 CFP (Sous Chef) Commercial Food Preparation Level 4 Events Planning & Management (Events Management) Level 4 Housekeeping (Housekeeping Management) Level 4 Entertainment and Events Management – Diploma Entertainment and Events Management – Associate Degree Pro Chef - Certificate	HEART Trust/NTA
BSc. Hotel and Tourism Management Degree	School of Hospitality and Tourism Management, UTECH
BSc in Food Service Management	School of Hospitality and Tourism Management, UTECH
Certificate in Baking Technology	School of Hospitality and Tourism Management, UTECH
Certificate in General Catering	School of Hospitality and Tourism Management, UTECH

Certificate in Pastry Making and Cake Decorating	School of Hospitality and Tourism Management, UTECH
Certificate in Events Planning and Management	School of Hospitality and Tourism Management, UTECH
MSc. Hospitality and Tourism Management	Centre for Hotel And Tourism Management, UWI
Bachelor of Science in Tourism Management	Centre for Hotel And Tourism Management, UWI
Associate of Science Degree in Tourism, Hospitality and Entertainment Management	School of Tourism and Hospitality Entertainment Management, Excelsior Community College
Bachelor of Science Degree in Tourism, Hospitality and Entertainment and Management	School of Tourism and Hospitality Entertainment Management, Excelsior Community College
Certificate in Tourism, Hospitality and Entertainment Management	School of Tourism and Hospitality Entertainment Management, Excelsior Community College
B.Sc. Tourism & Hospitality Management	University College of the Caribbean
A.Sc. Tourism & Hospitality Management	University College of the Caribbean
Bartending Skills Child Care and Recreation Cultural / Heritage Tourism Customer/Guest Relations & Sales Techniques Disaster Preparedness and Management Entertainment/ Recreation Management Environmental Awareness First Aid and Cardio-Pulmonary Resuscitation Food, Health and Safety Foreign Language Programmes Front Office Procedure Golf Caddie Development - Level 1 Health Awareness in the Workplace HIV/AIDS Awareness Programmes Housekeeping Skills Industrial Relations Practices for the Tourism Sector Kitchen Sanitation and Safety Management Strategies to Improve Staff Performance Management Development Programmes Organisational Development for Efficient Service Professional Bell Service Professional Villa Care Security Management Supervisory Management Skills Tour Guiding Tourism and Cultural Awareness Tourism Resort Security ourism Security Management Training Programmes for Travel Halt Personnel Visitor Relations and Customer Service	TPDCO

Food and Beverage Management Culinary Chef Management Hotel and Restaurant Management — Associate Degree, Diploma Certificate	Western Hospitality Institute
Hospitality Management - Bachelor Degree	Western Hospitality Institute
Tourism Management - Associate Degree and Diploma	Western Hospitality Institute
Short courses offered: Front Office Management Housekeeping Management Bartending Waitering	Western Hospitality Institute
Associate Degree in Hospitality &Tourism	Moneague College
Bachelors Degree in Hospitality &Tourism	Moneague College
Associate Of Science Hospitality Management	NCU
Travel, Tourism and Hospitality Management - Diploma	HECOIN
B.Sc. in Cruise Shipping and Marine Tourism Management	Caribbean Maritime Institute

5 Dominican Republic's Hospitality and Tourism Sector. Instituto Técnico Superior Comunitario - ISCT

5. Dominican Republic's Hospitality and Tourism Sector. Instituto Técnico Superior Comunitario [44]

Dominican Republic is the largest tourist destination in the Caribbean Region in hotel room number and tourist arrival. It has:

- More than 70,000 hotel rooms
- 37 golf courts
- 7 international airports
- Gross income from tourism of 5 billion and half dollars

Since more than ten years ago, more than one charter flight lands every hour in the country. Punta Cana International Airport is the busiest one receiving no less than 450 airplanes per week.

The country development in tourism came along a steady economic growth since 1996 when new young political leaders masterminded an overall developing plan of the nation. Santo Domingo was vertebrate with new highways, flyovers and subways, attracting in 2013 more than two billion dollars in direct investment and affront the challenge to prepare the country to receive10 million tourists per year in 2023.

5.1 The touristic product & economic review

Investment opportunities in Tourism

The Dominican Republic is the No. 1 tourist destination in the Caribbean Tourism sector represents more than 20% of the GDP in Dominican Republic, 70% of the total rooms offered at the tourism sector have been constructed and operated by foreign hotel chains. DR currently has 11,000 rooms under construction and new hotel projects. During 1 995-2000, the total hotel room offer in the Caribbean grew an annual rate of 4.1%; the DR grew 7.9 %.

The GDP grew 7.3% in the 2014, registering the most significant progress in the Caribbean Region, meaning, 6.1 points above the average of 1.2 % for Latin America and the Caribbean. In 2013 and 2014 DR received more than 5,000 million dollar in general direct investment. This good performance is the result of private entrepreneurial initiatives supported by fiscal and monetary policies, which are having an impact that is reflected in the positive growth of all economic activities.

44 Prepared by Gloria Alina Valdés (Gastronomy School Coordinator) and Pamela Perez Vizcaino (Chef Instructor) ISCT (www.isct.do)

- Mining (20.3%);
- Construction (13.8%);
- Brokerage and Financial Services (9.1%);
- Education (8.4%);
- Hotels, Bars and Restaurants (7.5%);
- Health (7.2%);
- Local manufacturing (5.5%);
- Trade (4.9%)
- Agriculture (4.4%),

Tourism is a key sector for the economy of the Dominican Republic. Last year revenues from this sector reached $ 638 million and 5 million 100 thousand tourists came to our country, becoming the first time the Dominican Republic received over 5 million tourists and confirming once again that has become the top destination in the region.

As for the cruise tourism sector, which we intend to pay special attention, recorded an increase of 25.4%. They also approved 34 new projects which added more than 11,000 new rooms offer and not less than 34 000 jobs to our people.

Indicators of the Hotel, bar and restaurant industry in 2014 in the DR

2014	Hotel occupancy rate	Tourism revenues in million US
Jan-Mar	88.5	1,548.10
Jan-Jun	80.5	2,899.20
Jan-Sept.	76	4,285.30

Source: ASONAHORES and Central Bank of the Dominican Republic

I Source markets

According to an article published in Euromonitor International about Travel and tourism to the Dominican Republic the country "saw a big increase in arrivals of Russian tourists in 2012, with 172,000 trips made and joining the top five source markets. As the Dominican Republic looks to new source markets, the Russian boom is a result of increased efforts in tourism promotion and participation in international events. Russia has already opened an embassy office in Punta Cana and may consider opening one in Puerto Plata, because many Russians head there."

This report also identified the most significant tourism source market for the Dominican Republic:

- United States
- Canada
- Germany
- Italy
- Other Countries of Europe

I Employment profile

		1991	2000	2010	1991-2000	2000-2010
Total Employment	TOTAL	2,251,709	3,041,092	3,753,529	789,383	712,437
	Male	1,607,916	2,027,852	2,416,027	419,936	388,175
	Female	643,793	1,013,240	1,337,502	369,447	324,262
Employment To Population Ratio(%)	TOTAl	51.6	54.2	55.5	2.6	1.3
	Male	73.5	73.0	72.6	-0.5	-0.4
	Female	29.3	35.3	38.5	6.0	3.2
Stla re of workers with primary or no education (%)	TOTAl	51.6	54.2	55.5	2.6	1.3
	Male	66.3	63.4	54.9	-3.5	-7.7
	Female	48.5	46.3	37.1	-1.5	-9.9
Official Unemployment Rate (%)	TOTAl	19.6	13.9	14.3	-5.7	0.5
	Male	12.5	7.9	9.8	-4.6	1.8
	Female	33.1	23.8	21.4	-9.3	-1.9
Open Unemployment Rate- llO revised (%) share of total employment	TOTAl	n/a	6.3	5.0	N/A	-1.3
	Male	N/A	4.1	3.9	N/A	-0.2
	Female	N/A	10.5	6.9	N/A	-3.6
Informal employment as a share of total employment (%) 1	TOTAl	N/A	52.9	56.5	N/A	3.6
US Immigrant visas Issued in Santo Domingo (total number)	TOTAl	38,870'	11,705	43,717	256,467	245,250

Source: ILO (2011a); US Department of State

Table 3-Dominican Republic, Employment by sector, 1991-2011(%)

	1991	2000	2011
TOTAL	100.0%	100.0%	100.0%
Agriculture and livestock	20.3%	15.9%	14.7%
Mining	0.3%	0.2%	0.5%
Manufacturing Industries	18.1%	17.1%	10.2%
Electricity, gas and water	0.4%	0.8%	0.8%
Construction	4.1%	6.3%	6.2%
Commerce and hotels, bars and restaurants	21.5%	26.9%	27.9%
o/w: hotels, bats and restaurants	-	5.2%	5.9%
Transport and Communications	6.0%	6.2%	7.4%
Financial Inter mediation and insurance	2.6%	1.9%	2.5%
Other services and public administration	26.5%	24.7%	29.9%
Public administration	-	4.2%	4.8%
Activities not specified	0.2%	-	-

Source: Dominican Republic Central Bank (DRCB)

I Educational programs related to gastronomy

Institution	Program	Duration
Instituto Técnico Superior Comunitario (ITSC)	Sênior Technícian in Gastronomy	2 Years
Pontifícia Universidad Católica Madre y Maestra (PUCMM)	Certified in Culinary Arts	9 Monts
	Degree in Hotel Management with Food And Beverage Concentration	4 Years
Universidad de Dominico Americano	Certified in Culinary Arts	1 Year
Universidad Iberoamericana (UNIBE)	Degree in Tourism and Hotel Management	3.5 Years
UNAPEC	Degree in Hotel Management with Food And Beverage Concentration	3.5 Years
O&M	Degree in Tourism and Hotel Management	3.2 Years
Universidad Nacional Pedro Henriquez Ureña (UNPHU)	Degree in Tourism and Hotel Management	3.2 Years
Escuela Dominicana de Alimentos y Bebidas A & B Masters	Technician in Culinary Arts	1 Year
	Pastry Course	4 Months
	Professional Cooking Course	2.5 Months

Instituto Nacional de Formación Técnico Profesional (INFOTEP)	Technician in Culinary Arts	600 Hrs.
	Technician in bakery	365 Hrs.
	Technician in pastry studies	415 Hrs.
Universidad Tecnológica de Santiago (UTESA)	Degree in Tourism and Hotel Management	4 Years
	Senior Technician in Tourism and Hotel Management	2 Years
Universidad del Caribe (UNICARIBE)	Degree in Tourism and Hotel Management	4 Years
Universidad Católica de Santo Domingo	Degree in Hotel Management	-
Universidad Central del Este	Degree in Tourism and Hotel Management	3.2 Years
UASD	Degree in Tourism and Hotel Management	-
Universidad Católica del Este	Degree in Tourism and Hotel Management	4 Years
Universidad Abierta para Adultos	Degree in Tourism and Hotel Management	4 Years
Católica Nordestana	Degree in Tourism and Hotel Management	3 Years and 4 Months

Emerging technologies

With the prospective analysis the strengthening of the training was addressed and the use of new kitchen technologies was stated along with the continuous update of the courses content.

A high demand for skilled cooks was identified, cooks than can manage properly the new software's for food cost, point of sales, electronic marketing and culinary products data sheets with new kitchen equipment for the use of fourth and fifth range products, vacuum pack meals, ozone water for food conservation, use of thermomix, and development of new types of menus.

The design of sustainable and green kitchens, the use of sous vide to promote the conservation of food's organoleptic qualities and as a cooking technique that allows preserving flavors and finding new textures in food, the use of induction cooktops and the use of online reservations.

New trends in the culinary world

- Gastronomy as a symbol of cultural identity
- Haute cuisine in casual places
- Affordable haute cuisine
- Return to a traditional way of dining
- Fifth and fourth range products

- New schemes in the conception of the menu and its portions (To share, ½portion, ¼ portion)
- More importance in the service performance
- New reservations systems

Challenges faced by the culinary education in the Dominican Republic

- Contemplate the correct use in classes of new emerging technologies in kitchen equipment, in a way that the students can take advantage of technology equipment found in workspaces (induction stoves and countertops, ozone water for vegetables conservation).
- Focus on the curriculum designs in applying techniques rather than learning recipes.
- The use of software's and sale points, not only for the service staff, but for the kitchen staff also. Restaurants and hotels don't often take full advantage of all the tools that these programs have to offer.
- Use of standard recipes and the correct use and application of the cost price analysis.
- Use of sous vide and all its possibilities and benefits. (Conservation of organoleptic and nutritional properties, cost and portion control).
- Chemistry labs that allow the study and examination of food, its chemical changes trough the cooking process and the effect of bacteria and microorganism to guarantee a better comprehension of food transformation.
- The use of ergonomic uniforms that allow a better performance in the kitchen environment.
- The use of the thermomix and the advantage of all its possible uses in the professional kitchens.
- The use of 0 Km products.
- The increase in the demand of the use of local products and seasonal products
- Trend towards healthier eating and a demand of healthier options in the menu.
- Increased demand for Caribbean cuisine as an opportunity to ensure integration of cultural and touristic part of the region.
- Project: Make a table of common products and common recipes from the countries of the region.
- Gastronomic marketing as a new root of the marketing due to its proper characteristics, completely different than service or other products marketing.
- The appearance of the figures of "Celebrity Chefs" influencing the perception of real culinary professionals.

- The slow food movement and the avoidance of mass production
- Deficiency in the sense of ethics.

Operational problems in the business sector

- Business owners don't support staff education. They don't have schedule flexibility and don't invest in staff's training.
- Lack of qualified and trained personal in a short term.
- Deficiencies in the standardization of processes inside the food and beverage businesses.
- Wages are low
- Many restaurants don't have the adequate equipment or space.
- Many food and beverage establishments don't have organized administrative criteria.
- Business owners prefer and value more foreign labor than local for management and direction positions.
- High cost of kitchen equipment is a challenge for restaurant owners.
- The inconsistency in the quality of the products provided by the suppliers makes maintaining quality an everyday challenge.

Improving to bring more investors to the Dominican Republic

It is necessary to find a way to guarantee the professional career of the student with culinary education inside the sector. Once they graduate and even during their studies, students tend to work as cooks for short-term periods in restaurants. This constant in and out of kitchen staff makes it difficult to guarantee quality and consistence in the outcomes.

Stakeholders must manage to create a grant fund with the goal of supporting gastronomy education of their staff. This fund could be also sponsored by private companies interested in qualified personal for their business, as an investment medium term to improve quality in the labor.

Dominican Republic must also validate the cook's profession by defining its competences at a national level.

Exploring new ways of marketing and commercialization is a challenge to overcome to improve international image of Dominican gastronomy. The design of campaigns that promote our food as a motivation to visit the country, a better presentation of the traditional dishes could be supported by the most famous Dominican restaurants, which could collaborate in a project involving the creation of haute Dominican gastronomy for its posterior marketing as an international gastronomy product.

To move forward the government must establish clear regulations for the foodservice industry, ensuring a link between the business sector and the government.

5.2 Taking Dominican Republic to the next level

In order to take the Dominican Republic to the next level in the gastronomy subject, we must look after the quality and the quantity of cooks that are graduated from the different culinary programs in the country. To pursue a better curriculum offer can assure better cooks, more capable of occupying higher jobs positions, and to surpass foreigners holding managerial positions.

The key factor to accomplish this is creating a common vision towards the development of gastronomy that unites all those involved in the sector (Private Sector, Educational Institutions and the Government) in order to elevate the international profile.

The private sector must consider providing reasonable schedules to employees who are enrolled in some kind of culinary education program, understanding the direct impact and benefits on its business, having as a result a better culinary performance that could lead a significant presence in international contests, fairs, and competitions, for a better promotion and image of the Dominican gastronomy. Agreements with international institutions could also support the education of students enrolled in culinary programs and providing support to curricular education.

I Technological trends

While it is true that technology in kitchen equipment is known for having extremely high cost, it is very necessary that students in culinary schools familiarize with the use of last generation equipment. If the schools doesn't have this kind of technology equipment, it must plan to reinforce these points by programming visits to places that do possess this technology or provide specific training in the use of it, supported with audiovisual material and practices.

It is an important factor that determines if you are consistent with the actual, for the reason that we should work geared to handle new technology trends in the industry.

I Proposals to improve culinary programs

During the workshop, we agreed in many interesting proposals in order to enrich and improve culinary educations programs. We talked about:

- Inviting each semester people of the industry to give support to the academic program and encouragement of the students.
- Compare our culinary education programs with other international programs and bring more instructors to support teachers and to assure a continue training and upgrade.
- Identify specific training needs (for teachers and students) and plan workshops to help mitigate these gaps, supported by other university and international culinary associations.

- Reviewing existing culinary education models of other countries
- Capturing highly trained instructors and ensure their ongoing training and updating.

I Occupational Impact

- Hotel Marketing
- Food and beverage Marketing
- Gastronomic Digital Marketing
- Gastronomic Marketing
- Food Products Research and Design
- Cost Management
- Experts Chefs in Dominican cuisine
- Industrial Engineering with concentration on process development for the food industry.
- Experts Chefs in Caribbean cuisine
- Culinary processes and standardization
- Customer Service training.
- Bakers and pastry chefs for restaurants
- Ice cream makers for restaurants
- Expert chef in vegan cooking

5.3 Recommendations

What we are doing so far might not guarantee a visible improvement in the conditions of food and beverage companies. We had a very cautious progress. We must ensure a better structuring of the training offer culinary schools. Mainly aim to improving responsiveness to market in terms of the need for trained staff in food and beverage companies' staff, which is in high demand, but faces low staff training. It is necessary to define a plan with common objectives for gastronomy and tourism in Dominican Republic involving culinary education institutions, bar and restaurants owners and the government.

- Update the syllabus for all the cooking classes offered in the program according to international standards established by the World Association of Chefs Society.
- Offer a modular based training program for graduates and professional in order to obtain actualization on new and emerging technologies each fall.

- Offer train the trainer workshop for the facilitators.
- Organize dissemination activities on emerging technologies in order to engage the diverse investors into a common view of the sector.
- Review the curriculum and its courses in order to detect new technologies training and provide the possibility of including professional electives in the plan of study.

The ITSC its willing to integrate all these initiative to its programs, in order to become a model for all the other institutions that are willing to apply these guidelines also, so we can all become together advocating for a better culinary education for the Dominican Republic.

6 Emerging technologies and occupational trends in the Tourism and Hospitality Sector. NTA. Trinidad & Tobago

6. Emerging technologies and occupational trends in the Tourism and Hospitality Sector. Trinidad's Hospitality and Tourism Sector. NTA. Trinidad & Tobago

6.1 Introduction

In the Trinidad and Tobago Hospitality Sector the following details the critical areas of cultural diversity and the business environment.

I The Tourism product

Table 1 – Highlights The Key Products Of Trinidad

	TRINIDAD
Unique Selling Proposition (USP)	Cultural diversity (religious and racial mix)
Main Types of Visitors	Business travelers Returning residents Independent travelers (not on pre-paid packaged holidays)
Main Source of Markets	USA Caribbean
Accommodation Types	Some large branded hotels Small, independent hotels, Bed & Breakfast, Apartments
Market Niches Targeted	Business Events and cultural attractions Ecotourism Diving Yachting Shopping Nightlife Historical sites Health Sports

Source: National Tourism Policy of Trinidad and Tobago, 2010

I Economic review

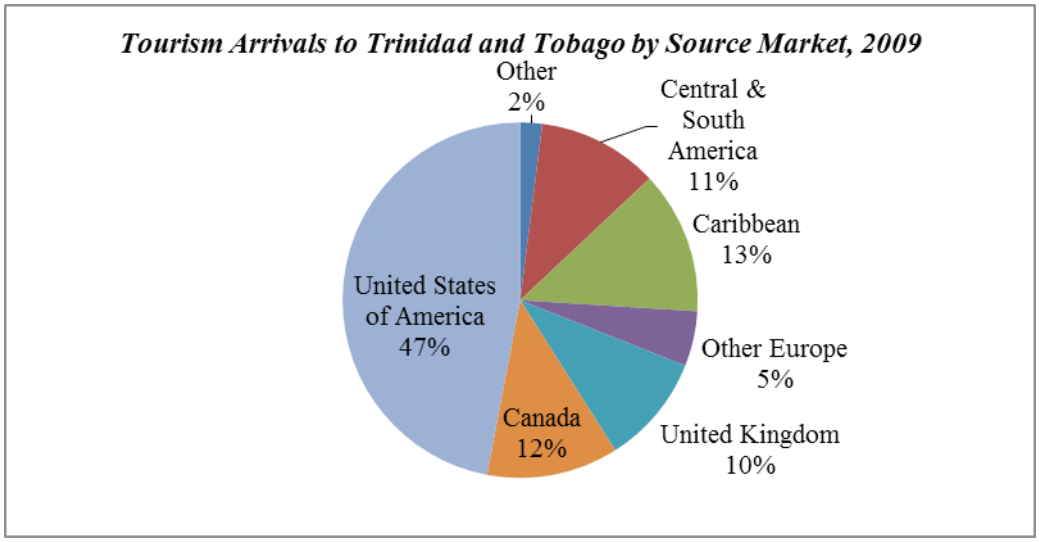
According to the World Travel and Tourism Council's (WTTC), Travel and Tourism Economic Impact Update, Trinidad and Tobago 2013, the direct contribution of Travel and Tourism to GDP was TTD6,817.7 million (4.4% of total GDP) in 2012. The total contribution of Travel and Tourism to GDP was TTD12,886.2 million (8.4% of GDP) in 2012.

I Source markets

The nation's main statistical office, the Central Statistical Office of Trinidad and Tobago (CSO) provided data which indicated that in 2009 the United States was the largest source market for arrival to Trinidad and Tobago was 47% of all arrivals in 2009. Following behind the USA was the Caribbean region which accounted for 13% or 58, 129.

CSO data also revealed that Canada accounted for 12% of arrivals (50,180) to Trinidad and Tobago in 2009. Central and South America contributed 11% or 46,934 tourist arrivals. For the United Kingdom the figures recorded were 10% (41,706) of arrivals. With regards to European countries the figures recorded were five percent (20,218) while the rest of the world recorded two percent (10,965) of arrivals.

Figure 1



Source: Central Statistical Office, 2009

I International air arrivals

The information below presents data received from the Statistical Overview of Tourism Performance in Trinidad and Tobago (2012). The results show a steady decline in arrivals for 2006 to 2009 while the 2010 figures show an increase with visitor arrivals totaling 384,699 (estimate for the year), an increase of 3.3% when compared to 2009.

Table 2 - Total Air Arrivals to Trinidad 2005-2010

	Total	Trinidad
Year	Arrivals	Arrivals
2004	442,555	363,826
2005	463,190	376,723
2006	461,051	377,591
2007	449,452	386,452
2008	437,279	399,498
2009	371,889	343,489
2010	384,699	360,661

Source: Central Statistical Office, 2010

I Employment profile

Based on statistics received from WTTC's 2009, Travel and Tourism Economic Impact Update - Trinidad and Tobago, the travel and tourism industry accounted for 14.7% of total employment in Trinidad and Tobago. This data indicates a total of 88,000 (direct and indirect) jobs in the sector. Direct industry employment was calculated to be 5.4% of total employment or 33,000 jobs.

I Tourism labour market

A snapshot of the supply side data of the Trinidad and Tobago Tourism and Hospitality Labour Market is highlighted in the table below.

Table 3

TRAINING PROVIDERS/ INSTITUTIONS AND TOURISM PROGRAMMES	
Training Provider/ Institution	Skill Training Areas/ Programmes
TTHTI - Trinidad	Craft Culinary Bartending Hotel Operations Tour Guiding Supervisory, Management And Related Tourism Training.
MuST	Hospitality and Tourism Technology Training – Level 1 (Caribbean Vocational Qualification)
SERVOL	Hospitality Food Preparation and Catering
UWI	Undergraduate in Hospitality and Tour Management, Hospitality and Tourism management, Hotel Management and Tourism Management Postgraduate Diploma in Tourism Development and Management M.Sc. Tourism Development and Management

6.2 Methodology employed

This exercise employed a combination of techniques. In the main, primary and secondary sources were used. Primary sourced information was gleaned from the face to face sessions with Tourism and Hospitality stakeholders. The secondary data were sourced both through an environmental scan of the sector and its current situation as well as a review of the thirty-five listed emerging technologies as indicated by ILO/SENAI in their guiding documents. Printed and online sources were also used to cull data on the sector.

The DELPHI Model was employed to extract the information from the sector's stakeholders. This technique aims at achieving a convergence of expert opinions and identifying common positions regarding coherent issues. The Delphi Model's main objective is to produce estimates, by means of a logical reasoning process, which will be compared, corrected and complemented at regular stimulation stages, by using the responses obtained in successive questionnaires.

The primary data was sourced from experts from the Tourism and Hospitality Sector. The process to obtain them was as follows: a list of key tourism and hospitality associations in the Trinidad and Tobago was created and representatives were invited via telephone and email. The experts were selected from various parts of the sector such as government agencies, tertiary institutions, tour guiding establishments and technocrats from tourism marketing companies. At the meeting a powerpoint presentation was given to the panel of experts where the DELPHI model, its objectives nature and scope were explained.

In order to clearly delineate the need for establishing specific emerging technologies in the sector, a general list of thirty-five (35) emerging technologies was disseminated to the group. The experts were given a period of one hour and a half to decide upon, in his or her opinion, which would be the specific emerging technologies within the Trinidad and Tobago Tourism and Hospitality Sector both over the next five (5) and ten (10) years respectively.

I Limitations

The first face to face session was quite productive and satisfied its intended purpose in that experts were able to complete the assigned tasks of deciding on the ten (10) emerging technologies in the Tourism and Hospitality Sector. The second activity was not as successful given that the experts could not all commit to completing the exercise of providing final data on the occupational trends in the sector. Reasons for the difficulty encountered in completing the tasks were numerous. However, the requisite information was received from a limited number of participants who attended the first session and the details have been added to this report.

List of Specific emerging technologies most likely to have impact on the tourism and hospitality sector in Trinidad and Tobago over the next five to ten years

1. Fifth range food products
2. Geo-marketing applications
3. ASP-based IT applications
4. Sustainable buildings
5. Multi-protective construction elements
6. SME industrial equipment
7. Thalassotherapy26 equipment for hotels
8. Equipment and systems to improve accessibility for disabled persons
9. State-of-the-art electronic translation devices
10. Smart labels for containers
11. Electronic forfeits (A payment system)

12. Satellite-enabled environmental management
13. Sustainable management of tourist resources
14. Personalized electronic guides
15. Telecommunications integration
16. Electronic booths
17. Energy saving micro-systems
18. Supply replenishing micro-systems
19. Non-polluting transport models
20. New laundry and dishwashing systems
21. Natural disaster prevention
22. Telecommunications protection
23. Mobile telephone services
24. Peripheral terminal services
25. Modular and versatile construction systems
26. CRM customer service systems
27. Food hygiene control systems
28. Global booking IT systems
29. Telephone IT systems for data-transmission via the Internet
30. Automatic hotel check-in and check-out IT systems
31. Tourist promotion virtual reality systems
32. Local communication systems and equipment in hotel and tourist enterprises
33. GPS systems and devices
34. Comprehensive corporate management software
35. Electronic service charge cards

I Other socio-economic trends

1. Claiming holidays as a vested right
2. Specifically age-related tourism
3. Retirement and laws related to pension rights

4. Increase in the economic status of younger persons
5. Variations in non-traditional family structures
6. Increase in the population's knowledge and culture, as a result of the use of the Internet
7. More frequent travelling and to a greater number of locations in developed countries with good tourist support
8. Demand for more sophisticated tourist services

6.3 Results

The results listed below reflect the list of ten (10) specific emerging technologies in Tourism and Hospitality resulting from the Delphi Model Activity at ILO/SENAI NTA Workshop held on January 15th at MTEST Offices, Trinidad and Tobago

1.Sustainable buildings
2. Equipment and systems to improve accessibility for disabled persons
3. State of the art electronic translation devices
4. Satellite-enabled environmental management
5. Sustainable management of tourist resources
6. Non-polluting transport
7. CRM customer control systems
8. Food hygiene control systems
9. Natural Disaster prevention
10.Tourist promotion virtual reality systems

I Occupational impact

Methodology employed

The identification of occupational impact was garnered from the same group of experts who participated in the technological prospection stage. At the end of the prospection they were told that they would receive a matrix for the identification of the occupational trends. Each expert was then asked to analyse the provided data and return via email as quickly as possible, their expert perspectives. The following occupations were identified initially: Sustainable Technology Advisers and CRM specialists.

Evolution of the Professional's Performance

The information culled from the second round of activity by the Tourism and Hospitality Experts is delineated below. The two areas in which there is to be an expected occupational impact and emerging technological trends are Sustainable Technology Advisers and CRM specialists.

Below is an amalgam of the responses expected for the skill and competencies for Sustainable Technology Advisers.

I Sustainable Technology Advisers

- Have knowledge of sustainable buildings
- Be able to guide tourism developers and resort planners on sustainable techniques that are not only cost efficient but environmentally friendly
- Must have training and competency in sustainable development and environmental management

With regards to considering the future technological context and indicating new activities, knowledge, skills and abilities that will lose importance in the performance of Sustainable Technology Advisers, the issues below were identified:

Activities - Increase in global booking systems

Knowledge - Because of this growth in IT, many travel agencies have been threatened and the use of them will significantly decrease over time

Skills - People today have access to the internet at the click of a button and they do their booking through "direct-sell" hotel or airline websites. Therefore, with the increase in technology, the traditional use of the Travel Agency as a retail agent will be decreased

Abilities - IT, Global booking systems

The information below is a compilation of the responses expected for the skill and competencies for CRM Specialists

I CRM specialists

- Have knowledge in IT and creating customer database
- Be able to draw from customer database and do relationship marketing. This creates long term return business for organizations
- Must have competency in Customer service, Management, and IT

With regards to considering the future technological context and indicating new activities, knowledge,

skills and abilities that will lose importance in the performance of CRM Specialists, the following responses were provided:

New Activities - Non-polluting transport models for example electronic cars are coming on stream in the US and UK

New Knowledge - Support systems for electric cars and sustainable green energy. Training and development in these areas

New Skills - Green energy for transport systems requires people with the technical know-how and ability

New Abilities - Managing these new systems of green transport systems, and also getting people to buy into this idea

6.4 Recommendations

I Contextualisation – Sustainability Technology Advisers

1. This initiative has the potential to enhance education and training in the area of both structural/ civil engineering and areas of technology suited to sustainability and green/eco reformation of buildings.
2. The probable use of these new technologies will allow for the further development of SMART buildings which will further add value to Trinidad and Tobago as a location of choice for safe environmentally friendly buildings.
3. New training opportunities need to be created by way of new curricula to treat with green/eco-friendly building construction techniques.

I Contextualisation - CRM specialists

1. Customer Service Relations need to be improved to ensure that stakeholders/customers in the Tourism and Hospitality Sector are adequately served and serviced. This new focus on enhancing the customers' experience from the beginning to the end of the service interaction will allow for a happier stakeholder/customer.
2. Training in this area of specialization has the potential to improve the customer relation relationship across the service industries in Trinidad and Tobago. Following the success of this initiative in the Tourism and Hospitality Sector, the spill off effects can redound to other aspects of customer-client relationships in Trinidad and Tobago

I Acknowledgements

This activity used a panel of experts from the Tourism and Hospitality Sector in Trinidad and Tobago. The following are the representatives and their institutions:

Company	Representative
Trinidad and Tobago Hospitality and Tourism Institute	Narendra Ramgulam
Trinidad and Tobago Tour Guides Association	Cheryl Borde-Johnson
Trinidad and Tobago Tourism Development Company	Norris Clement
Ministry of Tourism	Kavita Santokhie
Ministry of Tourism	Daniella Thomas
Ministry of Tourism	Shivana Maharaj
Trinidad and Tobago Tour Guides Association	Analicia Boyce
Trinidad and Tobago Tour Operators Association	Courtenay Rooks
Trinidad and Tobago Tour Operators Association	Tano Harewood
Trinidad and Tobago Tour Operators Association	Dominque Hosang

Staff from The National Training Agency are as follows:

Head, Research and Information	Meagan Sylvester
Occupational Standards Officer	Rodessia Richins
Research Officer	Akaash Ramkhalawan
Research Officer	La Toya Fortune
Graduate Intern	Elma Ramirez

7 Sint Maartens' Report. Hotel Sector. Outcomes. Department of Labour

7. Sint Maartens' Report. Hotel Sector. Outcomes. Department of Labour

7.1 Technological prospection

Number of participating experts: 19

Consisting of the following Steering committee members:

- Nikima Hickinson – Policy Advisor for the Department of Labour
- Selby Philip – Policy Advisor for the Department of Labour
- Ashma Berkel – Training Director of the Caribbean Institute For Social Education Foundation
- Theophilus Thompson – President of the Caribbean Institute For Social Education Foundation
- Carmen Barran – Human Resources Manager at Simpson Bay Resort, Management Company BV & Representative of the Sint Maarten Timeshare Association
- Ivette Jessurun-Franca - Board Member AVE (coordinator sector PSVE of the MPC)
- Andy Caballero - Simpson Bay Marina & Representative of the Sint Maarten Hospitality & Trade Association and the Sint Maarten Marine & Trade Association
- Jude Houston – Policy Advisor for the Department of Economic Affairs
- Geert Asselbergs – Policy Advisor for the Department of Education

Number of prospected technologies: 28
Number of selected technologies: 5
Used tool: Delphi pre-designed questionnaire & Occupational impact panel questionnaire
Number of rounds: 4

"Fast" dissemination technologies: Technologies which will reach 2/3 of their potential application in the market by 2019.

"Traditional" dissemination technologies: Technologies which will reach 1/3 of their potential application in the market until 2019 and 2/3 in 2024.

Technological segments	Selected Specific Emerging Technologies	Speed of dissemination
Information Technology for guest services	Mobile Check in- and out system	traditional
	Smart TV (digital television used to order movies, make spa appointments, arrange group tours, view room balance, etc.)	traditional
	Mobile point of sale system (digital apparatus that allows servers to take orders directly at the table)	traditional
	Electronic all inclusive bracelets	traditional
	Cell phone as key	traditional

Occupations	Current Activities	Current Abilities	Current Skills
Front Desk	Checks guests in and out (issuance of keys)	Problem solver	Organizational skills
	Make reservations	Good judgement	Writing & reading skills
	First contact for the hotel	Multitasking	Communicational skills
	Give relevant hotel information and provide guests services	Proper communication	Language
	Billing of guests	Provide information/ guest services	Customer service skills
	Administration	Take initiative	Administrative skills
	Telephone operation	Team player	Computer literacy

Night Auditor	Verification of guests billing account	Problem solver	Customer service skills
	Providing information	Good judgment	Communication skills
	Printing of reports	Multitasking	Basic accounting
	Wake up calls	Proper communication	Administrative skills
	Answering calls/operator	Provide information/ guests services	Computer literacy
	Check in- and out of late arrivals	Team player	Multitasking
	Assist guest	Take initiative	
	Coordinate services		
	Functions as a night manager		
	Input data, revise data		
	Administration		
Cashier	Financial administration	Multitasking	Counting
	Providing information to guest	Organizational skills	Communication skills
	Customer service	Taking initiative	Language skills
	Handle bills and payment	Ability to count	Customer service skills
	Keep inventory	Problem solving	
		Good judgment	
		Communication	
IT/Automation Specialist (mostly outsourced)	Up-keep information system	Problem solver	Computer literacy skills
	Maintenance	Multitasking	Soft-ware engineer/ maintenance

7.2 Occupational trends - new tasks/occupations

- Growing importance of the use of digital services, software and maintenance thereof.
- Emergence of IT Field Specialists (to ensure all-inclusive access is available and operating in the manner it should, at all times).

- Emergence of Telecommunication Specialists (to ensure the system is able to consistently handle the load of mobile interactions).
- Increasing importance for field controllers (to ensure the hotel visitors are not abusing/cheating the system).
- Growing need for digital tools and devices.
- Growing importance for language and communication skills as they pertain to customer service interaction.
- Incorporation of knowledge related to digital software and information technology on guest services, digital apparatus and technology.
- Incorporation of knowledge related to information technologies in the training of staff.
- Incorporation of customer service and communication.
- Incorporation of language and computer skills.
- Incorporation of digital billing/accounting system.

I New specific knowledge

- Technical assistance (IT maintenance)
- Customer service
- Accounting management
- IT management
- Logistics
- Process simplification
- Telecommunications

7.3 Recommendations – examples

- To include more technological information in current and future Hospitality curricular.
- To offer continuous training courses on the following topics: guest services, accounting, customer service, information technology & digital software; with a strong focus on guest services.
- To initiate continuous research in the field of Hospitality, due to the dynamic nature of this field and the vast demands and supply.
- To enhance national telecommunication service, to ensure sustained provision and accessibility.

- To intensify the training of professionals related to service providers (subcontractors).
- To ensure the tools, resources and materials are accessible & available; and to ensure proper training thereof.
- To ensure more cohesiveness of programs and policies, enabling public-private partnerships.
- To raise awareness of the importance of emerging technologies and occupational trends within the Hospitality industry.

8 Prospective studies. Transfer of the SENAI Prospective Model Programme

8. Prospective studies. Transfer of the SENAI Prospective Model Programme

The programme has been developing since 2012. It covered 22 countries of Latin America and the Caribbean in three stages: Central America and Dominican Republic; the English Caribbean Countries, and South America, reaching in total 78 technicians from several VTI and Ministries of Labour. The processes were facilitated by a team with SENAI led by Luiz Carusso and Marcello Pio with the support of ILO/Cinterfor. In total were conducted seven face-to-face workshops, two in the Caribbean (Port of Spain), four in Central America (San Salvador and Panama) and two in South America (Montevideo). The participants became part of a learning and practice community around the tool (http://evc.oitcinterfor.org). The 22 studies that have been completed, are available at: http://www.oitcinterfor.org/documentos/estudiosprospectivos

Central America and Dominican Republic Edition	Institution	Sector	Study
Costa Rica	INA	Construction	Civil construction
Costa Rica	INA	Green jobs	Carbon neutral
Costa Rica	INA	Green jobs	Technologies applied in vehicles and processes of maintenance and repair
Honduras	INFOP	Agricultural	Organic Agriculture
Dominican Republic	INFOTEP	Construction	Civil construction
Dominican Republic	INFOTEP	Green jobs	Clean technologies in ground transportation and maintenance processes
El Salvador	INSAFORP	Construction	Construction industry
El Salvador	INSAFORP	Green jobs	Collection and storage of recyclable materials
Guatemala	INTECAP	Food	Gastronomy
Guatemala	INTECAP	Tourism	Tourism

South America Edition			
Argentina	MTEySS	Automotive	Maintenance and repair
Brazil	SENAR	Agricultural	Milk cattle-Production
Colombia	Labour Ministry	Construction	Building construction
Colombia	SENA	Agricultural	Dairy Sector
Ecuador	SECAP	Agricultural	Agroforestais
Paraguay	SNPP	Construction	Construction
Peru	SENATI	Green jobs	Renewable energy technologies
Uruguay	MTSS-DINAE/ MEC/ CETP-UTU/INEFOP/ UDELAR	ICT	Software and computer services (SSI)
English Caribbean Countries Edition			
Jamaica	HEART Trust/ National Training Agency	Tourism	Hotel & restaurants services
Dominican Republic	Instituto Técnico Superior Comunitario	Tourism	Hospitality and Tourism Sector
Sint Maarten	Department of Labour	Tourism	Hotels
Trinidad and Tobago	National Training Agency	Tourism	Report on Emerging Technologies and Occupational Trends in the Tourism and Hospitality Sector

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