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THE COOPERATION OF THE INTERNATIONAL LABOUR OFFICE IN TRAINING  
OF TECHNICIANS AND SKILLED WORKERS FOR THE METAL INDUSTRIES 1/

contributed by

The International Labour Office

Part C: TRAINING OF PERSONNEL FOR THE LATIN AMERICAN STEEL  
TRANSFORMING INDUSTRIES

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1/ Report on the results obtained through technical training programmes  
(for workers and technicians) developed by the ILO in Latin  
America, and on the future aid that the ILO could offer to the  
Latin American steel making and transforming industries.



THE COOPERATION OF THE INTERNATIONAL LABOUR OFFICE  
IN TRAINING OF TECHNICIANS AND SKILLED  
WORKERS FOR THE METAL INDUSTRIES 1/

by the International Labour Office

Those interested in the industrial development of Latin American countries are aware, with growing concern, that the shortage of skilled workers, foremen and trained personnel, technicians and specialists, together with insufficient training of senior technical personnel, is an obstacle to the expansion or modernization of existing enterprises, as well as to the creation of new ones.

The report prepared for the Sixth Session of the Economic Commission for Latin America (ECLA)<sup>2/</sup> contains an interesting analysis of those factors which hinder development of the iron and steel making and transforming industries and restrict their productivity.

This report, dedicated mainly to describing the structure of these industries, could scarcely fail to mention the human factors of their development. It provides some appraisals of the roles of supervisory personnel, technicians and skilled workers which are summed up below:

In Brazil, although the vocational training system organized in 1942 by the Serviço Nacional de Aprendizagem Industrial (SENAI) has contributed considerably towards the development of the mechanical and steelmaking industries, there is a serious deficiency in the training of engineers and technicians directly responsible for the daily work organization. For, according to the report, there are no schools, either in Brazil or elsewhere in Latin America, which teach engineers and technicians how to organize their work. <sup>3/</sup>

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1/ Report on results obtained through technical training programmes (for workers and technicians) developed by the ILO in Latin America, and on the future aid that the ILO could offer to the Latin American steel making and transforming industries.

2/ Economic Commission for Latin America, Iron and Steel Transforming Industries in Selected Latin American Countries (E/CN.12/377), 29 August 1955.

3/ op. cit. p. 86.

In Colombia, the report notes the considerable efforts made, in particular by the national steelmaking enterprise of Paz del Rio, to train workers skilled in metallic construction; here again, however, it is stressed that the number of young people trained by the technical schools falls very short of the economy's needs for skilled workers.

A survey made in that country of directors of industrial schools and members of their teaching staffs showed that because of financial difficulties a large proportion of pupils abandoned their studies before completing their training. To remedy this state of affairs, shorter and more specialized courses should be organized. Stress is also laid on the urgent need to improve the quality of the teaching corps and the equipment of the shops. This survey also showed up the absence of any coordination between industrialists and those responsible for technical training.

Finally, the ECLA report emphasizes the importance of vocational training problems and their influence upon increasing productivity. It states that in view of the serious difficulties existing in most Latin American countries, there are great opportunities for professional organizations to take action at the national level as well as for international collaboration. <sup>4/</sup>

These statements confirm those already made by the International Labour Organisation, either in its reports specially prepared for Latin American States Members of ILO, or in its special studies designed to pave the way for technical assistance activities and to guide their development.

A brief review follows of the titles and contents of the more important publications in this field.

As long ago as 1946, ILO prepared a report on vocational training for the third Conference of American States Members of ILO (Mexico) <sup>5/</sup>, which stressed that vocational training had become a matter of national importance to all the Latin American countries, and that in view of the wave of industrialization sweeping over them, the old methods by which one generation passes on its own special skills to the next were no longer sufficient.

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<sup>4/</sup> op. cit. p. 159

<sup>5/</sup> ILO Vocational Training, Report II to the Third Conference of American States Members of the ILO, Montreal, 1946.



In 1948, at the request of the Assistant Director of ECLA, the International Labour Office undertook a new, more systematic and more detailed study, the results of which were published in 1951.<sup>6/</sup> This study dealt principally with teaching relating to industrial, agricultural and commercial subjects; moreover it provided a broad outline of the way in which the training systems of each country are organized, making their functions sufficiently clear to permit full understanding of the problems which the public authorities have to solve.

The publications of the International Labour Office are not confined to describing facts but, according to a metaphor used by the workers' delegate from Peru at the 39th Session of the International Labour Conference, they constitute "a veritable mine of technical information".<sup>7/</sup>

The assembly of first-hand information concerning specific solutions for vocational training problems, their concise presentation and an assurance of widespread diffusion are in fact the ideas which have inspired the preparation of reports such as Vocational Training and Promotion in the Iron and Steel Industry,<sup>8/</sup> and Vocational Training and Promotion in the Metal Trades.<sup>9/</sup> These two reports are a repertory of practical measures adopted at the level of the shop, enterprise or professional organization to ensure the basic and advanced training of workers in different skills and at different levels of qualifications. Moreover, in a study entitled Factors affecting Productivity in the Metal Trades,<sup>10/</sup> first place is given in the inventory of these factors to questions relating to selection of workers, rational organization of work, to skilled labour and vocational training.

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6/ ILO Vocational Training in Latin America, Studies and Reports 1951, N.S.28, Geneva.

7/ ILO Provisional Record, No.11, 14.6.1956.

8/ ILO Report to the Iron and Steel Committee, Fourth Session, 1952.

9/ ILO Report to the Metal Trades Committee, Third Session, 1949.

10/ ILO Report III to the Fourth Session, Geneva, 1952.

The reports just mentioned were prepared by the ILO for two industry committees whose fields of activity cover the iron and steel industry and the metal trades. These committees, with their three-fold structure, bring together every two or three years the representatives of those countries where these industries are particularly important. The number of countries belonging to each of these two committees is at present 21; of these Brazil, Chile, Colombia and Mexico belong to the Iron and Steel Committee and Chile and Mexico to the Metal Trades Committee. The reports mentioned above have been the subject of detailed discussion, on the basis of which the committees reached certain conclusions. These conclusions have since been communicated to the governments and, through them, to the interested employer and worker organizations. It is perhaps worth mentioning that the Iron and Steel Committee will hold its sixth session during the second half of 1957; one of the items on the agenda is: "Working conditions and social problems related to steel making in countries with a growing economy". Vocational training problems, particularly among the Latin American countries, will of course be reviewed in this study.

Practical methods for increasing productivity were the object of a meeting of experts called by ILO in December 1952. In order to help the experts in their discussions, the ILO prepared a report entitled Higher Productivity in Manufacturing Industries,<sup>11/</sup> which was subsequently published. As far as education and vocational training are concerned, these experts issued a warning which is worth quoting in full, since it condenses the subject matter of all the studies mentioned above.

"Education and vocational training can make a major contribution to higher productivity. Special attention is drawn to the following points:

a) The organization of educational and vocational training activities requires foresight in estimating both present and future trends in requirements for different categories of workers and different kinds of skill.

b) Management's capacity to discharge its responsibilities for raising productivity can be increased by means of appropriate training designed to promote "productivity consciousness" based on a thorough

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<sup>11/</sup> Studies and Reports, 1954, N.S. 38.

understanding of the basic principles and the social objectives and implications of techniques for raising productivity.

c) Much of the initiative for making specific proposals and for applying specific measures for raising productivity must come from scientists, engineers, technicians and industrial relations and personnel officers employed in industry. There is an acute shortage of persons trained in the principles and techniques of industrial engineering and organization, and a great need for expanding facilities for their training. In this connection universities and technical colleges can make an important contribution and should, where necessary in order to meet this need, introduce or expand courses in industrial organization and industrial engineering.

d) There is growing recognition of the cardinal importance of adequate training for foremen and supervisors not only in their technical and administrative duties but also, and perhaps especially, in the principles of human relations, since it is of the highest importance that there should be mutual confidence and friendly relations between supervisors and their personnel.

e) Systems of basic training for skilled workers should not be unduly specialized. They should aim at imparting general information and cultivating general interests and abilities of value in a variety of actual working conditions. Systems of basic training should be supplemented and completed by other types of training designed to develop specialized skills and to facilitate the promotion of workers to positions of greater responsibility and skill.

f) The necessity for training semi-skilled workers, as distinct from skilled workers, is more and more widely recognized. Experience has shown that the time required to learn a job can often be shortened, the number of failures reduced and the process of learning converted into a more satisfying experience if adequate instruction for semi-skilled workers is provided.

g) Special training programmes may be needed in undertakings or industries where measures to raise productivity are in process of application, in order to enable workers to adapt their skills to changes in production techniques or equipment or to facilitate the re-employment of displaced workers or workers threatened with displacement.

/h) It

h) It may be desirable, particularly for establishments which are not familiar with modern techniques for increasing productivity, to put into operation programmes to increase productivity which require training in these techniques in the first place for supervisory personnel and subsequently for all personnel; for this purpose it will be necessary to give special training to selected members of the supervisory personnel who will be responsible for the programmes. It is important that the action of those responsible for such programmes be effectively supported by management. It is recommended that such programmes be co-ordinated at the industrial or regional level.

(Source: International Labour Review, Vol. LXVII, N° 4., April 1953, pp. 327-8)

The inauguration of the United Nations Expanded Technical Assistance Programme has, since 1950, enabled ILO to associate itself with the efforts made by the Latin American countries to find a new basis and new methods for solving their manpower problems, that is, employment organization and vocational training.

In view of the wide range just of vocational training problems which have only been briefly outlined above, spectacular results can scarcely be expected after only six years of activity. Nevertheless, on the credit side of the ILO's technical assistance activities some results may be mentioned showing the value of the methods and measures put in hand and providing a gauge of the probable success of future activities.

Among the activities undertaken by ILO in Latin America, some deal more specifically with the particular problems of vocational training for the iron and steel making and transforming industries.

First of all, there is the programme to provide scholarships for study abroad for Colombian workers and technicians. This programme originated at the first meeting of experts on the iron and steel industry held at Bogota (Colombia) in October-November 1952, during which the ILO representative stated that any requests for technical assistance in the field of vocational training for the iron and steel industry would be carefully considered.<sup>12/</sup> Shortly after that meeting, the Government of

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<sup>12/</sup> A Study of the Iron and Steel Industry in Latin America, United Nations Publication, Sales N° 1954 II.G.3, Volume II, page 392.

Colombia requested, within the terms of existing agreements <sup>13/</sup> that a certain number of scholarships be granted to workers and technicians belonging to the Paz del Rio steel mill. (Acerías Paz del Rio, S.A.)<sup>14/</sup>

The directors of this enterprise, were at that time engaged in the building, assembly and entry into operation, by stages, of the technical installations; they recognized that skilled workers and technicians who would subsequently occupy key posts in the new enterprise, could not receive adequate training and instruction on the spot. The obvious solution was to send them abroad and place them in a similar industry.

The first problem was to choose which key posts ought to be filled by workers who had benefited from a course abroad. The ILO simply pointed out to the enterprise the advisability of distributing nominations among the principal departments. <sup>15/</sup> In fact, as will be seen later on, a satisfactory balance was found by assigning four scholarships to the blast furnace department, two to the steelmaking department, one to the foundry (second melting) seven to the rolling mills, three to the maintenance services and one to the chemical laboratory. The preliminary choice of candidates was made without delay. The ILO expressed the wish that as many candidates as possible should be examined. For instance, to select the ten trainees for the course in Chile, twenty candidates were examined by an industrial psychology specialist attached to ILO. Without entering into any details as to the procedures adopted, it suffices to

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<sup>13/</sup> Basic agreement and supplementary agreement N°3, signed at Lake Success on 24 November 1950.

<sup>14/</sup> See the article by Joaquin Prieto Isaza and Benjamín Alvarado, "La Siderúrgica de Paz de Rio" in Ingeniería Internacional e Industria, February 1952, which describes the state of the work at that time.

<sup>15/</sup> It should be noted that the same system has been adopted to meet a request for technical assistance submitted by the Government of Venezuela on behalf of the personnel of the steel mill now in course of erection. The International Labour Office, through one of its experts passing through Caracas, drew up with the Special Studies Service of the Presidency, a special list of the key posts that ought to be reserved for men who have previously taken a course in a similar enterprise abroad.

say that in this programme the ILO was guided by the principle, applied in all the programmes carried out under its auspices, of confining its assistance to those skilled workers and technicians who already had some knowledge and experience. To be fruitful, a course abroad ought in fact to be granted to men who are capable, once their course is over, of teaching their new knowledge to others. Technical assistance ought to constitute a chain reaction; this can only be done by means of carefully prepared and executed transfers whereby those individuals who receive such assistance become "donors" in their turn. <sup>16/</sup>

At the preparatory stage, a careful search was made for the most suitable countries and industrial establishments to receive the selected trainees. No stone was left unturned to satisfy the Government of Colombia and the steel mill. Several exploratory missions were undertaken in the different countries capable of receiving the trainees. In some cases, the choice was narrowed by certain technical considerations: this was so, for instance, in the case of the Thomas converter operator and the dolomite worker, who could only be placed in mills in France or Luxemburg. However, the Paz del Rio mill gave preference, wherever possible, to Spanish-speaking countries in order to avoid language problems. In fact, it was subsequently proved that the Colombian technicians who went to Europe were severely handicapped by not knowing the language of the host country.

Table 1 shows the different enterprises which received the trainees.

As for the material conditions under which the scholarships were granted, the ten trainees sent to Chile received a monthly allowance from the International Labour Office, which was paid out to them by the competent services in the host enterprise. In addition, upon arrival they received an "installation allowance" intended for the purchase of clothing, work shoes and other equipment. An accident insurance policy was taken out by the host enterprise. As for risks of illness, the host enterprise undertook to cover the expenses of any illnesses which might be incurred.

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<sup>16/</sup> See M. Thudichum, "Trainee workers - a form of technical assistance" Revue Internationale du Travail, Vol. LXX, N°2, August 1954.



RECAPITULATION OF PLACEMENTS

	Country and host enterprise	Commencement, termination, duration	Functions for which the course was organized			Remarks
			Department	Grade	Job specification	
1	<u>Chile: Compañía de acero del Pacífico Huachipato</u>	6.12.53-5.6.54; 6 months	Rolling mill	Technician	Head of rolling department (rails and shapes)	
2	ditto	"	Rolling mill	Technician	In charge of multiple stand rolling mill	
3	"	"	Blast furnace	Skilled worker	Blast furnace operator	
4	"	"	Blast furnace	"	Foreman blast furnace operator	
5	"	"	Blast furnace	"	Head of charge preparation	
6	"	"	Rolling mill	"	Rolling mill operator (small shapes and wire)	
7	"	"	Maintenance	"	Roll shop turner	
8	"	"	Foundry	"	Sand preparation operator	
9	"	"	Rolling mill	"	Slabbing mill operator	
10	"	"	Rolling mill	"	Rolling mill operator	
11	<u>France: Sidelor, Usine Micheville Villerupt</u>	27.1.54-26.7.54; 6 mo.	Rolling mill	Draughtsman	Specialist in roll plans (for rolling shapes)	
12	<u>Union des mines et de la métallurgie, Longwy</u>	22.3.54-21.9.54; 6 mo.	Steel mill	Skilled worker	Thomas blast furnace operator	
13	"	29.3.54-28.9.54; 6 mo.	Rolling mill	Technician	Rail rolling technician	Stay extended for six months after 28.9.54 by firm of origin.
14	<u>Luxembourg: Arbed, Division; Belval</u>	15.2.54-14.8.54; 6 mo.	Steel mill	Skilled worker	Dolomite operator. Making of linings for Bessemer convert.	
15	<u>Brazil: Companhia Siderurgica Nacional, Volta Redonda</u>	1.10.54-31.3.55 6 months	Maintenance	Technician	Electrical mechanic specialized in maintenance of control and measuring apparatus.	
16	"	"	Chemical Laboratory	Chemist	Laboratory analyst (coal and by-products)	
17	"	1.4.55-31.8.55; 6 mo.	Maintenance	Technician	Electrical technician	
18	"	1.4.55-24.5.55 2 months	Blast furnace	Technician	Gas recuperation technician	Stay cut short by illness

/The four

The four trainees sent to France and Luxemburg also received a monthly allowance from the International Labour Office. The Colombian mill undertook to cover accident and health insurance. Altogether, in order to meet any immediate requirement which might arise (medical attention, hospitalization), it was agreed that the three trainees in France would be insured by the Social Security Office of the district where they lived. The International Labour Office undertook to pay half the travelling expenses of two of the trainees sent to Europe. For the other two, particularly for one whose stay was prolonged to six months, the Colombian enterprise assumed responsibility for all travelling costs.

The four trainees placed in Brazil also received a monthly allowance from the International Labour Office. Travelling expenses were divided between the Colombian enterprise and ILO. The Brazilian host company granted them the same benefits as its own engineers: lodging in the homes of engineers at Volta Redonda, entry card to the cooperative and the canteen. Medical expenses were for the account of the trainees, but they were able to take advantage of the Company's special services. An accident insurance policy was taken out in their favour by the Colombian enterprise.

The ILO controlled the efficacy of the course in several ways. The selection procedure described above was one of the first and most important of such measures. Each trainee was asked to sign, at the time of selection, an agreement for the strict observance of the internal regulations and disciplinary measures of the host enterprise. As seen above, the functions for which the trainees had to prepare themselves were defined by the enterprise of origin. The ILO considers it very important that a programme be drawn up in advance to cover the development of the course and that the execution of this programme is entrusted to a competent person expressly nominated by the host enterprise. This has been one of the essential items in the negotiations with the host enterprises which preceded the courses.

For each of the ten trainees sent to Chile, a programme was drawn up by an ILO staff member during an official mission to that country in November 1953.



The fulfilment of this programme was made the responsibility of the Chief of the Division of Industrial Security and Vocational Training at the Compañía de Acero del Pacífico.

The same arrangements were made for the trainees sent to Brazil.

In the case of the four trainees sent to Europe, the Colombian steel mill was able, through its chief engineer's personal contacts, to explain just what it wanted from the course.

Moreover, ILO representatives visited the host enterprises to check on the progress of the courses.

The ILO correspondent in Chile was in permanent contact with the host enterprise and visited the trainees while they were at work.

The International Labour Office on two occasions sent one of its staff members from Geneva to visit the enterprises in France and Luxembourg where the Colombian trainees were placed. The second visit, made in the middle of a course, was particularly useful since it led to one trainee's programme being reduced because it was obviously too heavy for him.

The four trainees who went to Europe, and who found considerable difficulty in adapting themselves to the unfamiliar surroundings, expressed their sincere appreciation of the attention which they received. The Latin American centre of the International Labour Office, which was then in Brazil, followed the training of the Colombians who went to that country.

The best criterion of the value of the training may most probably be formed from reports by the trainees themselves, made during and after the course, and from written and verbal reports by the host enterprises.

The Compañía de Acero del Pacífico sent a very detailed report to the International Labour Office, which was duly forwarded to the enterprise of origin. The host enterprises in Europe also reported on their trainees.

Finally, in a letter dated 31 January 1955, the Empresa Siderúrgica Nacional de Paz de Río S.A. expressed their gratitude to the ILO for the collaboration of that Organization. The letter added that the

/trainees had

trainees had all resumed work in their various production departments, where they would be able to apply the knowledge acquired abroad.

This description of the foreign training programme for Colombian workers has been given in some detail, since it is a good example of a specific effort towards perfecting the knowledge of workers and technicians in the iron and steel industry, which should be of special interest to readers of this report.

However, efforts of this type cannot produce noteworthy results by themselves. According to competent opinion, they must be supplemented by the introduction of wider programmes for the development of all means of vocational training, and by the dissemination of elementary general and technical knowledge amongst workers as a whole.

A general plan of vocational training must include the following principal points: apprenticeship, adult training, training of foremen, supervisors, instructors and teachers. A review of the ILO's activities in Latin America shows that some progress has been made in most directions, but that much still remains to be done.

The Argentine Government has requested technical assistance from the ILO for the reorganization of the Comisión Nacional de Aprendizaje y Orientación Profesional, an institution responsible for worker training to meet the needs of industry. This Commission is under the Ministry of Labour and Welfare, its chairman being the Minister. The Ministry of Industry and Trade, and the Ministry of Education are represented, as are also the workers' and employers' associations. There is thus direct co-ordination between the interested ministries and the industrial vocational training organizations. It has been agreed that the vocational training specialist to be supplied by the ILO should first advise on organization plans, and afterwards assist in preparing courses for the teaching staff of the Commission.

In Bolivia, an ILO specialist has helped to establish an apprenticeship section for various trades within an existing school, and is at present studying the further training of instructors for this section. He has also given his advice on the reorganization of the national vocational training system, and has formulated programmes

for short vocational courses for adults within this scheme. He is taking an active part in the preparation of youth-training programmes, and is giving the benefit of his technical knowledge to the Bolivian Government, which is attempting to create a vocational training service under the Ministry of Labour and to revise the laws covering apprenticeship contracts.

In Colombia, another ILO specialist commenced adult training, and after making a survey of labour requirements, organized courses in the wood and metal working trades.

There is one important sphere, however, in which the ILO has not yet been able to give any wide-spread assistance in Latin America; this is the training of supervisory personnel, which should be the object of particular attention.

The training of foremen and supervisors is especially difficult in countries in process of industrialization, since too few of the workers have sufficient general education, or the necessary qualifications, whilst those who have some technical school training are often without any practical industrial knowledge or aptitude for understanding the workers' problems.

The ILO considers that the aims of vocational training of foremen and supervisors should be to:

- i) improve promotion prospects for those workers who show aptitude for supervisory tasks;
- ii) give a better understanding of their specific role, and of modern supervisory methods and systems to graduates who enter industry at supervisory level;
- iii) give additional technical, administrative and human relations training to existing supervisory staff.

In addition to these precise aims, vocational training for supervisors should include improvement of human relations at various levels of the organization, and raising productivity by the introduction of new or improved supervisory techniques. Vocational training of supervisors must have two aspects - technical and non-technical. Even in those countries where the requirements for skilled workers are

/easily met,

easily met, vocational training of foremen should include both these aspects. In the majority of countries with a growing economy, it is particularly necessary that future foremen and supervisors should receive a broad complementary training. Those who have acquired some technical knowledge at school need intensive practical training, whilst promoted workers should receive additional general and technical education. Both categories should, however, receive non-technical training designed to develop their ability to direct, distribute and superintend the work.

The Fourth Session of the Consultative Committee of Employees and Intellectual Workers, to be held in October 1956, will examine the general problem of working conditions of technical personnel and foremen in industry. Brazil, Mexico, Peru and Uruguay are represented on this Commission.

The ILO can offer assistance to any country in the following fields:

- i) determination of the type of vocational training required by foremen and supervisors;
- ii) assistance in the preparation of training schemes for foremen in specific industries;
- iii) assistance in setting up establishments for vocational training of foremen;
- iv) assistance in the organization on a local or national scale of seminars for personnel charged with the vocational training of foremen;
- v) providing, especially in newly-formed industries, experienced foreign foremen capable of undertaking on-the-job training for existing foremen and supervisors.

The application of a specific programme such as T.W.I. (Training Within Industry), should be considered merely as a starting point, and not as an end in itself, in the execution of more complete vocational training schemes for foremen.

The ILO has already carried out several programmes of vocational training for instructors and teachers in Latin America, such as for instance, one in collaboration with S.E.N.A.I. in 1952-53, when

thirteen specialists visited Brazil in order to give basic and advanced training, within the establishments of S.E.N.A.I., to teachers and industrial vocational training instructors, both Brazilian and from other Latin American countries.

Other activities include two regional seminars for directors and administrators of vocational training schools and services in Latin America, organized jointly by the ILO and S.E.N.A.I. in 1953 and 1955 for the benefit of Brazilian and other Latin American pupils. These two seminars allowed the pupils to examine vocational training problems in Latin America as a whole, to compare alternative solutions, and to discuss others which might be applicable to their various countries.

