

VET in Peru - Dual model of vocational training in SENATI

Angles, Enrique and Lindemann, Hans-Juergen

Abstract

In this article, we provide an overview over the sustainable development of a dual VET system in Peru as an emerging country in the last four decades. Servicio Nacional de Adiestramiento y Trabajo Industrial (SENATI) is a private non-profit VET training institution in Peru, which was founded by National Society of Industries in 1961. The SENATI dual learning program is industry-led and was established in 1985 to provide dual professional training (two learning venues: training company and SENATI - acting as vocational school and inter-company training center at the same time. German Dual VET and CBT, coined by the recent Anglo-Saxon TVET sphere, have had a strong influence in design and implementation of dual learning program. Other topics included are vocational education, differences to CBT, company-based training and an introduction to a new research project of the Technical University of Dortmund called “PeruDual”. It will examine the factors that have led to sustained successful cooperation between SENATI and the training companies since its inception in 1985. These factors are not well known by research bodies. Using document analysis, we find that the basis of dual VET in Peru is not the relationship of the training companies to the vocational schools, but the relationship of the training institution SENATI to the companies. We thus conclude that some characteristics of employer engagement (National Society of Industries and training companies) in Dual VET are: dual learning (especially in-company learning), definition of qualification standards and of the new training occupations to be offered and definition when to update curriculums. The fundamentals of dual-VET model are applied didactic, action learning and project method.

Keywords: Dual VET Peru, PeruDual, SENATI, Dual VET Model, profile of trainers, action orientated learning, project method

Inhalt

Introduction: Dual model of vocational training in SENATI Peru	2
I. Peru’s Economy, demand for skilled workers and VET	3
II.1. Economy, demand for skilled workers and professional technicians	3
I.2. Dual vocational training in Peru and the research project “PeruDual”	4
II. Dual VET-model of SENATI	5
III Establishment and development of a dual training model in Peru.....	8
III.1. Modernisation of training at the end of the 1990s – Assessment of work requirements and design of modularised curricula	8
III.2. Design of dual training and education with holistic competence from 1998 to 2003.....	9
III.3. Implementation of a dual training model from 1998 to 2003	11
III.4. Introduction of new and deepening of existing vocational pedagogical elements	11
III.5. Duality and organization of in-company training.....	12
IV Outlook for the future	14

Introduction: Dual model of vocational training in SENATI Peru

Dual VET is in demand worldwide, and dual forms of vocational training are becoming more and more common in many countries. The model is the dual vocational training system in Central Europe, especially in Switzerland and Germany. This article deals with the qualification of skilled workers in Latin America and Peru in particular. Despite economic progress in the last decade, Peru still has comparatively low-skilled industrial workers. These industrial workers must be trained, so Peruvian industry could take part in global value chains with more products. From the mid-1990s onwards, the globalisation of production and services led to certain sectors of Latin American countries participating in global value creation and still doing so today (automobile industry in Mexico, mining industry in Peru) or manufacturing products for globally organised markets (agricultural products such as asparagus, artichokes in Peru). International requirements and standards as well as a high level of quality are becoming increasingly important, which is why countries face the challenge of training skilled workers and professional technicians with relatively high qualifications. In contrast to the Competency-Based Training (CBT), which trains specific skills in modules for specific activities in short courses, the dual training system is expected to lead to a broader competence profile, a high level of skills, a more thoroughly trained professional (holistic) competence with a deeper understanding and broader specialist knowledge.

SENATI (*Servicio Nacional de Adiestramiento en Trabajo Industrial*) is a non-profit VET institution in Peru. According to Moura (1997), an important contribution of Germany to Latin American countries was the spread of German dual training system via German development institutions. In the second half of the 1990s, SENATI's dual VET model was not only influenced by German dual training system, but also by the Anglo-American-style, CBT, modularised competence-based training and education (*competencias laborales*), that dominated at the time in almost all other Latin American countries. In Latin America, the *Centro Interamericano para el Desarrollo del Conocimiento en la Formación Profesional* (OIT/Cinterfor) of the International Labour Organisation (ILO), based in Montevideo-Uruguay, had a major influence, contributing greatly to the dissemination of the CBT with its small-scale competencies (cf. Zúñiga (1998); Vargas (2004)). There is a fundamental difference between competencies in state of competence! The messages that were spread: Short training period, flexible design due to modular form, easy to use and quick to implement. Development of curricula via "DACUM" or "functional analysis"; and direct 'translation' of requirements into competencies, which from a German perspective can be described as pure skills. The model for standard development in Latin America, especially the methodological approach, was the Mexican "CONOCER" (cf. Hernandez 2000). One question, however, could not be answered precisely by any of those consultants: How to train competence, and, with which methods? It was not said with which training model the output model should be implemented: At the conceptual level, it is quickly possible to formulate a competence standard for the assessment of individual competencies, but how can a meaningful sequencing of learning progressive be achieved if in fact no curriculum - apart from the sequence of relatively spontaneously compiled modules - exists? The CBT system originates at the conceptual level, it is quickly possible to formulate a competence standard

for the assessment of individual competencies, but how can a meaningful sequencing of learning progressive be achieved if in fact no curriculum - apart from the sequence of relatively spontaneously compiled modules - exists? The CBT system originates from the continuous training and not from initial training and education systems. In Peru, further training profiles were developed using the so-called DACUM method,(with the view back, not directed at future technological developments) from the end of the 1990s onwards, despite all the warnings and indications from consulting organisations in Switzerland and Germany about the weaknesses inherent in modular training plans for high qualification levels.

As different as dual VET models may be in the individual countries, in principle it is always a question of including the company as a learning venue in the training of young skilled workers. School education in connection with rudimentary forms of workshop training (*talleres*) has existed and continues to exist for a long time in many Latin American countries. They are mostly originated in and around a catching up industrialization in the middle of the last century. What is still hardly known in research today is based on two general questions: 1st: How exactly does in-company training take place in companies, how do young people learn in web-based or work-related learning settings (Dehnbostel/Schröder 2017), and 2nd: How is cooperation of companies with schools and training workshops organised, how is duality specifically developed? The new research project PeruDual, which is funded by the Federal Ministry of Education and Research (BMBF) and conducted by the Chair of International Cooperation and TVET Systems at TU Dortmund University, is investigating these questions. In essence, a dual training model is about linking experience-based in-company learning with systematic learning by a training organisation or vocational school in a didactically intelligent way.

I. Peru's Economy, demand for skilled workers and VET

II.1. Economy, demand for skilled workers and professional technicians

Peru is the third largest country in South America with an area of 1.3 million km². Peru borders Ecuador and Colombia to the north, Bolivia to the southeast, Chile to the south, and the Pacific Ocean to the west. There are 31.8 million people living in Peru (GTAI, 2018), where the youth unemployment rate between the ages of 15 and 29 is four times higher than the adult unemployment rate (Peruvian Ministry of Labor and Employment Promotion - MTPS-, 2018). Peru's economy relies mainly on its natural resources. This explains Peru's need to be open to world trade, as its economic well-being is intimately connected to the trade partnerships it benefits of. In the last decades, Peru has increased its political and economic relations with Asia demonstrated by the various trade agreements they have made within the region. 92% of Peru's exports are covered by Free Trade Agreements. Additionally, Peru is one of the few members of the Asia Pacific Economic Cooperation (APEC). Furthermore, Peru also is a member of Pacific Economic Cooperation Council (PECC).

Peru is the second largest producer of silver, copper and zinc and the sixth largest gold producer in the world. Peruvian exports amounted to \$ 36.3 billion in 2017, with ores and minerals accounting for 67% of total exports; agricultural products make up 11%. Industrial products were also exported to a significant extent. Industrial companies are integrated into global value chains.

Peru has a shortage of skilled workers and technicians. According to the Peruvian educational institution SENATI (2017a), the country needs around 300,000 skilled workers every year, but only 110,000 are qualified as well skilled workers or as professional technicians (*técnico mando medio*) per year. Approximately 43% of companies have problems filling their vacancies (Manpower International 2019).

I.2. Dual vocational training in Peru and the research project “PeruDual”

SENATI is a non-profit VET institution, which was created by the National Society of Industries in 1961 in Peru. It has an industry-led dual learning program, which offers 73 training occupations nationwide, and has more than 97,000 apprentices in approximately 16,000 training companies, with 3600 teaching instructors (SENATI 2019). Since the mid-1990s, SENATI, has been providing a dual training. The dual form of training has been gradually developed over the last 20 years. The different stages of development of dual training and education (dual VET) in SENATI have been presented systematically by Angles/Lindemann (2018). This article refers thereto in the items: “Design of dual training in SENATI” and “Introduction of new and deepening of existing vocational pedagogical elements”. However, as far as learning in companies is concerned, there are still several unanswered questions about the quality of in-company vocational training. Are small and medium-sized enterprises in particular more likely to offer informal apprenticeships, or do they provide more or less structured training according to training plans? Do the companies have training personnel and how is the training personnel qualified? The new research project “PeruDual” is investigating these questions.

From 2019 to 2021, the research project “PeruDual” will examine the factors that have led to sustained successful cooperation between SENATI and the companies providing dual vocational training in Peru. The dual training model for industrial occupations in Peru, which is similar to that in Germany, has been successfully established over the past three decades. Each year there are around 97,000 young people in the dual training model and 400.000 have been successful qualified in the last 10 years (SENATI 2018). The research project “PeruDual” will analyse and research the following key questions:

- a) Which requirements, functions and roles do the trainers take on in the operations?
- b) How was the cooperation between learning venues specific to Peru able to develop, how did an in-company training culture develop? Which structure has been created for in-company vocational training, especially for small and medium-sized enterprises, SMEs (most young people in the dual form of vocational training are trained in Peru in SMEs), and
- c) Which successful conditions for a successful transfer of dual vocational training to Latin American countries and beyond can be identified based on the dual training model in Peru?

As a result, recommendations for action on the design of in-company training and the development of dual forms of learning, dual VET models and the identification of further desiderata for international vocational training research and development will be sought.

After a document analysis on site in Lima, Peru, the research questions above mentioned above will be pursued with qualitative methods. The question of access to businesses plays a decisive role in this. Qualitative research approaches have not yet been very pronounced in Latin America, which is why particular attention should be paid to opening up the field of research. In order to achieve the research objectives of the project from a methodological point of view, interviews are to be conducted with company owners, in-company-trainers, other training personnel (for example qualified workers) and trainees in probably three pilot zones in training enterprises in order to collect further data. This will be done in cooperation with the Peruvian *Universidad Peruana Cayetano Heredia* (UPCH). UPCH is active in education management, but so far has only a limited vocational pedagogical profile. However, UPCH trains SENATI teachers in cooperation and as a part of an internal SENATI further training program. In addition, PeruDual plan to offer a component of capacity building for lecturers and selected students (SENATI trainers). Data should also be collected from trainers who have direct field access to the object of research, in-company training, in-company trainers and company management.

The survey data will be evaluated on site and presented to the stakeholders in workshops and analysed together with a view to the conclusions. The results as well as the additional findings from the workshops will be documented, subjected to a communicative validation or prepared, evaluated and summarised under systematic criteria.

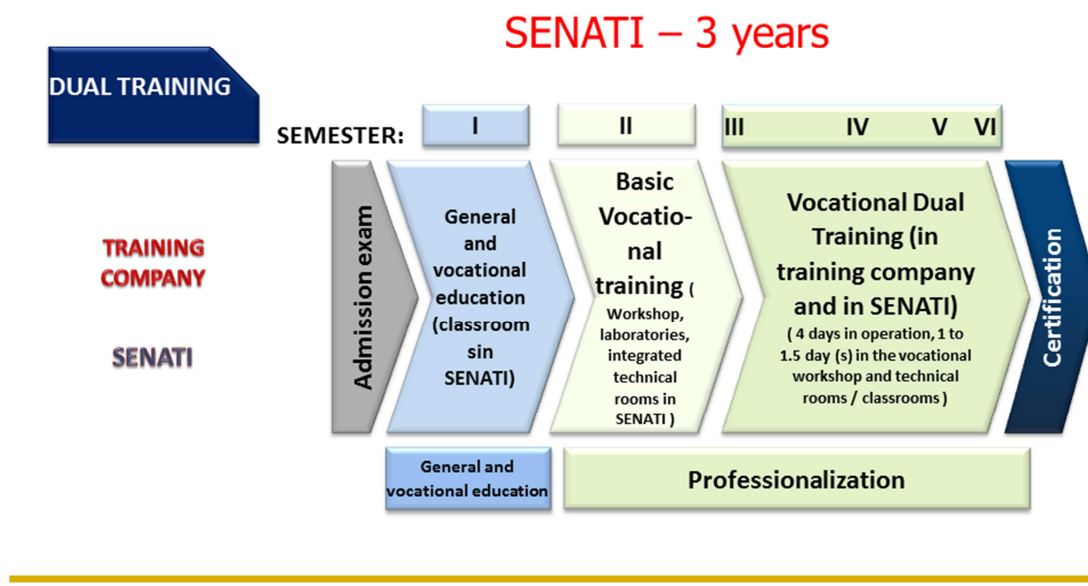
II. Dual VET-model of SENATI

SENATI started its dual VET pilot project from 1975 until 1984. SENATI has developed its own model of dual training (Dual-VET-model): Dual training takes place at the learning venues of the SENATI training-centres and in companies. From a historical perspective, the dual mode has developed out of workshop training. The basis of vocational competence development in the dual mode is the training of basic skills in workshop training, where the specialist knowledge, the theory is also instructed in the SENATI. Depending on the training programme, the training lasts two to three years, whereby from the third or fourth semester onwards, training takes place alternately in the company (4 days a week) and in SENATI (one day a week). Experience-based company learning and systematic practical and theoretical learning are didactically linked. Training is provided by the Peruvian National Society of Industries “*Sociedad Nacional de Industrias*” (SNI) and mostly by training companies affiliated to the association. The pedagogical model of SENATI can be summarized under "action orientated learning and learning by doing", considering that apprentices have better possibilities to develop competencies for work by executing tasks or face productive problems in real work situations in training companies (SENATI 2018). The workshop training within SENATI is based on action orientated learning.

The current pedagogical model of SENATI's dual VET with apprenticeship in companies is constituted by:

1. General and vocational training [1st semester] - the training is done in SENATI (classrooms and workshops)
2. Basic vocational training [2nd and 3rd semester] - the training is done in SENATI (Workshops, laboratories, classrooms)
3. Vocational dual training (Specific training) [4th, 5th and 6th semester] - The training is carried out in the company and in SENATI (Workshops and laboratories, classrooms)

Vocational Dual Training (VET) model:



(SENATI 2018, modified by the authors)

Figure 1: Dual Training model (SENATI 2018)

SENATI offers 73 dual training programs, 73 different occupations or technicians. It is voluntary for training companies to hire SENATI graduates after finishing Dual VET programs. But more than 50% of training companies hire their SENATI trainees (Angles 2019).

The following table shows a differentiated definition of the dual training model. The criteria according to which the dual model was specified are taken from the article by Dehnbostel/ Lindemann (2016), Internationalisation of vocational education and training, Core principles and corner points of dual vocational training system in international vocational training.

Table1: Dual training model.

Criteria	Development SENATI - DUAL	Remarks
Cooperation of the state, economy and social partners	Private sector organization. The dual training system is supported by the employer's association and companies. Other social actors such as trade unions do not play a role.	Cooperation with the state at the normative level: qualification frameworks, guidelines for standards, testing and certification regulations. SENATI carries out tests and issues certificates.
Learning within the working process (work-related learning in companies)	Work-related learning in and beside work takes place in training companies. In-company-learning is accompanied and continuously evaluated.	PeruDual will investigate the intensity to which in-company training takes place: in informal learning or more structured learning according to training plans.
Education management and education controlling (training evaluation)	SENATI organizes the dual-VET, places trainees. SENATI accompanies the in-company-learning, supports in-company-trainers and evaluates the in-company training.	On the contrary of German dual VET, chambers of commerce and industry do not play any role in the dual VET-model of SENATI.
Permeability and equivalence	Dual initial training is closely linked to SENATI further training. Institutionally, there is no integration into state vocational training or education programmes.	In SENATI: promotion of general competences, language, mathematics. SENATI graduates enjoy improved access to university studies (bachelor-courses)
Socially accepted national standards	SENATI develops its own standards for training programmes within the framework of government guidelines. SENATI conducts examinations independently.	The certificates are highly regarded by Peruvian companies and in the national context.
Qualified vocational training staff	SENATI has qualified trainers and lecturers and runs its own continuing education programs. In-company trainers are available and are qualified.	The research project PeruDual-project will investigate the degree to which in-company trainers and qualified workers are assigned to their trainees
Places, forms and concepts of learning	At SENATI, workshops provide competence-oriented training using action-oriented methods. Companies have company training plans (<i>plan de rotación</i>)	The working hypothesis is that training in companies follows the expert novice model. Short briefings are common practice.

III Establishment and development of a dual training model in Peru

In the eighties of the last century, SENATI began its dual VET learning program (*aprendizaje dual*) as the SENATI understood and called it. Following the pilot phase, the systematic introduction and expansion of the dual training model in the Peruvian provinces (regions) began around the mid-1980s. SENATI had also founded and established training centres in larger cities (Arequipa; Trujillo for example) outside Lima, the capital city. From these, the dual training system was expanded by adding the company as a learning venue to the proven workshop training system. After a phase of cooperative training in which extended company internships were integrated into the training, the dual training model was also introduced on a regional basis. The training was aimed primarily at small and medium-sized enterprises, which dominated the Peruvian provinces and continue to do so today.

With the first central guidelines and a guideline for the organisation of the dual learning model in the mid-1990s, the basic form of an in-company training plan was introduced in companies, the so-called rotation plan" (*plan de rotación*). Owners of small and medium enterprises were encouraged to employ trainees at different workplaces and in different work processes and practices.

III.1. Modernisation of training at the end of the 1990s – Assessment of work requirements and design of modularised curricula

At the end of the nineties, SENATI modernized the curricula according to the then dominant paradigm of competence-based modularized curricula of Anglo-American character. Training lasted two or two and a half years at that time and comprised 10 - 12 modules. Training courses with a higher quality standard - e. g. car training courses - lasted 2.5 years, today these training courses last three years.

A modernization of the regulatory system was necessary in Peru's economy. New machine generations with numerical control (keywords: CNC machines, CAD-CAM, etc.) were introduced into the companies. The maintenance of motor vehicles with electronic engine control as well as the information technologies had to be mastered. It was necessary to modernise motor vehicle training, electrical and electronic occupations, printing occupations, IT occupations, modern occupations in the media sector with a holistic approach to competence (cf. Lindemann, H. -J. / Tippelt, R. 1998²2000).

SENATI had various international cooperation projects and programmes in the 1990s and above all from 2000 onwards, with the German GTZ (*Gesellschaft für Technische Zusammenarbeit*, today GIZ, (*Gesellschaft für Internationale Zusammenarbeit*) and an organisation from Switzerland acting as consultants in the implementation of the dual training model.

In SENATI, the implementation of the dual training model was subordinated to the institution's own personnel development department, whose former director, Jorge Castro, coordinated the implementation and coordinated it with the management of the organisation. The implementation of dual training was completed with the implementation of the modernised training plans (CBT-modular plans) according to the pattern of competence-based

modularised training concepts and modular curricula. However, with the globalization and modernization of industrial production in Peru from approx. 1997, the management of SENATI also concluded that both the quality of workshop training according to the system of small-scale competencies and the practical implementation in the workshops did not meet the quality requirements formulated by the companies via the SENATI supervisory board.

III.2. Design of dual training and education with holistic competence from 1998 to 2003

There was enormous pressure to modernise vocational training. In the mid-1990s, the SENATI was faced with the challenge of improving the quality of training (cf. Tippelt 2000g), modernising technical training courses and at the same time developing and expanding the dual training model offering dual learning in the regional training-centres.

1. Modernisation of training: The first newly developed modularised curricula were available from 1997, but with a small-scale competence structure in the training modules. The work requirements have been determined using the DACUM method. The curricular reorientation was strongly influenced by the CINTERFOR of the OIT, whose experts had also advised and supported SENATI (cf. Zúñiga 1998). The competencies followed the approach of the so-called labour competencies "*competencias laborales*"¹, which was spreading in Latin America at that time. The curricula previously developed by German experts according to the course concept were considered too extensive and outdated - which was correct. They were regarded as subject-oriented and thus not modern, because they were not designed to be competence-oriented. There is a fundamental difference

¹ In the second half of the 1990s, SENATI was also influenced by the Anglo-American-style, CBT, modularised competence-based training and education (*competencias laborales*), that dominated at the time in almost all other Latin American countries. In Latin America, the *Centro Interamericano para el Desarrollo del Conocimiento en la Formación Profesional* (OIT/Cinterfor) of the International Labour Organisation (ILO), based in Montevideo-Uruguay, had a major influence, contributing greatly to the dissemination of the modular competency based concept (CBT) with its small-scale competencies (cf. Zúñiga, Vargas 1998 and 2004). There is a fundamental difference between competencies in state of competence! The messages that were spread: Short training period, flexible design due to modular form, easy to use and quick to implement. Development of curricula via "DACIÚM" or "functional analysis"; and direct 'translation' of requirements into competencies, which from a German perspective can be described as pure skills. The model for standard development in Latin America, especially the methodological approach, was the Mexican "CONOCER" (cf. Hernandez 2000). One question, however, could not be answered precisely by any of those consultants: How to train competence, and, with which methods? It was not said with which training model the output model should be implemented: At the conceptual level, it is quickly possible to formulate a competence standard for the assessment of individual competencies, but how can a meaningful sequencing of learning progressive be achieved if in fact no curriculum - apart from the sequence of relatively spontaneously compiled modules - exists? The CBT system originates from the continuous training and not from initial training and education systems. In Peru, further training profiles were developed using the so-called DACUM method,(with the view back, not directed at future technological developments) from the end of the 1990s onwards, despite all the warnings and indications from consulting organisations in Switzerland and Germany about the weaknesses inherent in modular training plans for high qualification levels.

between competence (German approach) in state of competencies! However, the consultants of the OIT and the Spanish organisations had not given the SENATI the idea that a competence orientation must also entail a changed training with other training methods that activate the trainees. The competence-based modularised short training was initially regarded as the paradigm for being able to quickly design and introduce market-adapted and flexibly configurable training courses to get young people into work in a very short time. The DACUM method has the disadvantage of only retrospectively capturing tasks and work processes. Future technical developments, such as numerically controlled masts (CNC), new electronic systems, etc. are not included. All this stood against the implementation of a dual training model with the training of action competence for the middle skilled worker- and technician level (*técnico mando medio*)

2. SENATI was faced with the problem of not having qualified trainers who could provide competence-oriented training and had basic vocational pedagogical knowledge. An education of the trainers, a program "Train the Trainer" was inevitable.
3. Duality: Until the end of the nineties, SENATI never surveyed how training was carried out in companies during the pilot phase. Did the duality go significantly beyond an informal apprenticeship in the companies? Dual training and how to implement it, how to get in-company-trainers, how to implement a dual learning model - these were the questions and problems that needed to be solved.
4. Training of own specialists, own personnel for the own company? Such thinking was and is still foreign to many companies today. At the end of the nineties it was also a question of creating a new training culture based on sustainability and the quality of skilled work.

Against this background, SENATI developed workshop training on a broad scale towards the dual model, workshop training + in-company training, with consulting organisations from Germany and Switzerland at the end of the 1990s. The core of the reform should consist of the implementation of the new modernised modular curricula in the dual mode.

Particularly from the mid-1990s onwards, the demand for qualified workers and technicians in industrial occupations continued to grow (in Germany we would speak of qualified skilled workers). There were plenty of forecasts, the globalisation of value chains was on the horizon and the demand for skilled workers came primarily from growing industrial companies and export-oriented SMEs (small and medium-sized enterprises). The elements of the reform and the expansion of training while implementing a dual training model on a broad scale were the following:

- Training of more holistic and action-orientated competence, problem solving for everyday working life, introduction of action-oriented learning in the workshops, introduction of project-oriented and task-oriented forms of learning in all dual training venues.
- Development of a training programme for trainers, development of a new profile for trainers, which is also the basis for drafting employment contracts. The requirements of vocational education were included in the employment contracts.

Rudolf Tippelt (Ludwig Maximilian University of Munich, Chair of Educational Sciences, Germany) played an important role in the consultation. He has developed a whole series of handouts on the fundamentals of dual vocational training.

III.3. Implementation of a dual training model from 1998 to 2003

The implementation of new CBT-curricula in a dual training model was based on a holistic approach of a competence-model, a vocational-educational component of active learning in projects and with a task-oriented approach in the workshops, a personnel development component "Train the Trainer"; and an accompanying organisational consultancy to cope with the changes within the organisation SENATI. The main aim should also be to address companies with the support of organisational development, to sensitize them and to win them over to training. These work lines were transferred to the internal qualification department called "IFPI". The IFPI was directly under the national management of SENATI in Lima.

Duality, how can the cooperation of training centres, schools and companies be improved, a local network be designed? Dual forms of learning, learning in training centres and learning in the workplace appeared to the SENATI actors in the regions as well as to the management of SENATI as a component unknown in a certain sense. SENATI knew forms and organization of in-company training from large companies mainly in Lima, where a certain training structure and training organisation had been designed by the SENATI trainers, who often also had training and controlling functions in companies. There were approximate ideas as to what was available in the area of in-company training for learning by doing (influenced by John Dewey from the USA) and how in-company training should be developed systematically (work-related learning, training plan, Germany). This was also due to the internal structure of the individual training centres. On the one hand, the contact to the companies was made by the management of the regional centres, on the other hand each trainer knew mostly from his own biography - most of the trainers came from companies that then became training companies - future training companies or companies to which young people were sent during the first company placements as pilots. Agreements were reached with the German partners to sensitise company owners to the "dual"; learning and to improve communication with companies via trainer evenings and similar measures. SENATI could rely on the support of the organisational development component of its partners from Germany.

III.4. Introduction of new and deepening of existing vocational pedagogical elements

The vocational didactic quality improvement comprised technical counselling - on modifying and cautiously adapting the curricula already drawn up to the challenges of the respective modernisation in the training profiles (cf. Tippelt 2000 c), on cooperation with companies at the lower (local) level, and on comprehensive and in-depth qualification of management personnel and experienced trainers (multiplier model for disseminating the reform) in the fundamentals of vocational training know-how common in Germany at the time (multiplier model for disseminating the reform). The core elements were basic elements of a didactics of vocational learning. The project method with the principle of action orientation (aprendizaje por la acción / metodo de los seis pasos) aims at vocational fields of action and problem areas on the one hand, and on the other hand, the projects are intended to achieve learning in

complex contexts and problem areas. Trainers gradually created complex training and learning arrangements using the project method. The concept of the work- and learning task is about being able to map concrete manufacturing or maintenance procedures from the companies as complete work actions and to implement them in the workshop. In addition to skills and knowledge, trainers also train methodological and social skills. The aim of the new SENATI training methods is to increase the learning competence of both the trainers and the trainees. It was about the systematic introduction of action orientated learning, work- and learning tasks, activating methods such as the project method (cf. GTZ/ Lindemann 2001 / Lindemann 2002), a new form of connecting learning in the workshop with learning in companies, cooperation of SENATI-centres with companies, the fixation of the role and task of in-company trainers (cf. Tippelt 2000 b), the integration of specialist trainers. The project method (cf. Tippelt 2000 e), the work – and learning tasks (cf. Lindemann 2003), the promotion and training of extra-functional competences (cf. Lindemann / Tippelt 2000), etc. were also introduced and implemented in three pilot centres with the support of the consultants. Furthermore, a compromise had to be found between the new standards of Competency-Based training with a modular structure and small-scale competences on the one hand and curricular planning with broader action-oriented competences and training plans that guaranteed a minimum of sequencing of vocational learning on the other (cf. Tippelt 2000c / Tippelt 2000d and Lindemann 1998).

This working line was implemented in a practice-oriented way through a multiplier model in the sense of a self-similarity action-oriented way. The development of new professional didactic content (seminars by R. Tippelt) was followed by implementation in three pilot centres (carried out by the author HJL in tandem with one or two SENATI multipliers each) in Lima, Arequipa (southern regions) and Trujillo (northern regions). After a joint planning period of almost two years, these measures lasted four years and were accompanied by organisational consulting measures and the qualification of management personnel. Changing a training culture both in the SENATI training organisation and to some extent in in-company training is complex, difficult, and fraught with setbacks and success can only be seen after intensive intervention. After all, it is a question of a cultural change in vocational instruction in workshops, teaching and learning, a cultural change that had to be mastered above all by trainers at SENATI as well as by company training personnel.

III.5. Duality and organization of in-company training

Dehnbostel (2007) says that *“training companies consider in-company learning to be much more important than learning in courses, seminars that are offered outside the workplace and often also outside the company”*.

In-company training: The basis of duality in Peru is not the relationship between the chambers and companies and the vocational schools, but the relationship between the SENATI training institution, the regional centres of SENATI and the companies. The SENATI offers workshop and theoretical training. Duality, this relationship was shaped in the implementation phase in such a way that the trainers of the respective training institution in a region regularly visited the companies. Each trainer had been assigned a certain number of companies. Visits to large companies or to companies of former SENATI trainees were very targeted, but often too short

from the authors' point of view. The trainer talked to the trainee, looked at the progress of the training and talked to the in-company training personnel. In small enterprises in both the formal and informal sectors, in which most trainees learn, the discussions were situation-related, flexible and informal. The visits had a dual character: on the one hand, they were intended to have a formative influence on in-company training and, on the other hand, to monitor learning progress or to ensure that training takes place.

Profile of the trainer at SENATI



" ... un asesor, facilitador y 'constructor' de situaciones de aprendizajes ... "

An advisor, facilitator and 'constructor' of learning situations.

- Professional training at a higher level (university)
- Proven work Experience, three years of industry experience
- Knowledge of technology and practice of occupation
- Use of TIC 's
- Pedagogical training in active methodologies

Figure 2: Professional profile, training and development of SENATI trainer

SENATI teaching staff are university professionals without pedagogical experience, so SENATI assumes their pedagogical training. The monitors are workers designated by the training company and are trained in the dual VET model and elements of pedagogy by SENATI.

When this model was introduced at the end of the nineties, the focus was on advising the training personnel in the companies and accompanying the trainees.

The study by Doris Edelmann (2000) shows that "visits of SENATI-instructors to companies last an average of 15 minutes, often only 5 or 10 minutes"; (Edelmann 2000, p. 13) when the training specialist is employed or not present. It is not always possible for the instructor of the SENATI, to talk to the trainee and In-company-trainer; or to visit him at his workplace (cf.

Edelmann 2000). In any case, it is checked whether and how the training takes place in the companies. Discussions about the training situation, the trainee's state of competence-development and health, a brief reflection on his or her current activities, and his or her integration into company work processes are often virtually non-existent. Due to missing data, it is unfortunately not possible to give more exact details. Compared to the practice of 15 years ago, in many regions today it is specially commissioned evaluators who carry out the company visits. This puts the control function in the foreground. The PeruDual project will intend to examine in more detail the in-company training situation and the relationship between the evaluators of SENATI and the training personnel in the companies.

IV Outlook for the future

Since 1985, SENATI has developed its own dual training model from a workshop training programme that has existed since SENATI was founded in 1961. The modernization of Peruvian industry has been the main driver for the evolution of SENATI's dual model, with the objective of training the qualified workers and technicians that the industry needed. The dual training model was implemented on a broad basis from the end of the 1990s, having influences of German dual system and a modular curriculum being based on Competence-Based Training (CBT) model. CBT influence was carried by ILO/Cinterfor in Latin America in the 1990s. The Peruvian National Society of Industry is involved in Dual learning programs of SENATI mainly in three aspects: dual learning (especially in-company learning), definition of qualification standards and of the new training occupations to be offered, definition when to update curriculums and its financial participation to cover the operative costs of SENATI. In bilateral cooperation with Germany and Switzerland, train the trainer programs, applied didactical programs for VET were carried out and a basic vocational training and education concept was created with an active and situational learning approach, project method, task orientation and much more.

SENATI is a private non-profit educational institution with technical, operational, financial and pedagogical autonomy; which allows it to make quicker decisions, since it does not depend on the Peruvian Ministry of Education or any other Peruvian state entity. SENATI develops its own standards for training programs, organizes dual VET by itself, and carries out tests and issues certificates, these certificates are highly regarded by Peruvian companies.

The implementation of the dual training helped SENATI to expand nationally, creating new training centres (from 3 training centres in 1985 to 73 training centres in 2018). Under its dual training model SENATI is training 95.000 apprentices² (SENATI 2019). SENATI has qualified more than 400.000 young people in the last 30 years. This was possible because most of the apprentices'

² By way of comparison, around 430,000 young people are qualified every year in the state vocational schools (IST) with three-year training. The focus is on the agricultural sector, including health professions, to a lesser extent industrial technical occupations for small and little companies, building occupations, electricians, etc. SENATI mainly trains industrial occupations and industrial-technical occupations for the skilled trades on a dual basis.

training has been carried out by the training companies, for which SENATI needed less investment to create regional (small) training centres. Without the employer engagement of Peruvian companies and the SNI, dual VET SENATI would not reach sustainability.

Companies were gradually integrated into the training system, with the duality being managed by the regional training centres and organized by instructors of the SENATI-centres. The degree to which in-company learning, work-related learning goes beyond the novice-expert model of more informal learning, whether and how in-company training plans could be implemented, whether and how in-company trainers have a more or less consistent training plan, remains reserved for research in the PeruDual project, which is being conducted by the TU Dortmund and two Peruvian partners (UPCH and SENATI). As a result of the research project PeruDual recommendations will be established and diffused for the design of company training and for the construction of dual Vocational training systems and the identification of continuing desiderata to the international VET research and development.

References

- Angles, E.; Lindemann, H. (2018): Professionalization of dual vocational training and education in Peru (Professionalisierung der dualen Berufsausbildung in Peru). In Gessler, M., Fuchs, M., Pilz, M. [Hrsg.] (2018): Concepts and effects of transfer Dual Vocational Training (Konzepte und Wirkungen des Transfers Dualer Berufsausbildung), Springer VS, July 2018
- Angles, E. (2019). Fallstudie "Berufliche Bildung über die peruanische Berufsbildungsinstitution SENATI". In: EU-ProjektEuroSOCIAL- EU-LAC-Stiftung (Hrsg.). „¿Cómo generar empleabilidad para la juventud?Experiencias innovadoras de alternancia formativa en América Latina, el Caribe y la Unión Europea." Roma: März 2019. S. 199.
- Dehnbostel, P./Schröder, T. (2017): Work-based and Work-related Learning – Models and Learning Concepts, TVET@ASIA issue 9, 1-16. Online: http://www.tvetonline.asia/issue9/dehnbostel_schroeder_tv9.pdf Accessed 14 June 2019
- Dehnbostel, P. & Lindemann, H.-J. (2016): Internationalisation of vocational education and training, Core principles and corner points of dual vocational training system in international vocational training / Internationalisierung der Berufsbildung, Prinzipien und Eckpunkte eines dualen Berufsbildungssystems. In: Manfred Schönebeck Ada Pellert [Hrsg.] (2016): Von der Kutsche zur Cloud – globale Bildung sucht neue Wege, Springer Fachmedien Wiesbaden 2016
- Dehnbostel, P. (2007): Learning in the Process of Work, Waxmann, Muenster /New York / Muenchen / Berlin 2007
- Edelmann, Doris (2000). Untersuchung zum Verhältnis zwischen Ausbildern des SENATI und Lehrlingsbetreuern in den Betrieben (Bericht). Lima: SENATI.

German Trade & Invest –GTAI- (2018). Wirtschaftsdaten Kompakt: Peru.

https://www.gtai.de/GTAI/Content/DE/Trade/Fachdaten/MKT/2016/05/mkt201605028009_159550_wirtschaftsdaten-kompakt--peru.pdf?v=4 Letzter Zugriff: 09.Juni 2019

German Technical Cooperation Agency GTZ (2001) (Hrsg.): Lindemann, H.-J.: Handlungsorientiertes Lernen einführen, Handlungsorientiertes Lernen und Projektmethode in der Aus- und Weiterbildung - Aprendizaje por Acción y método del Proyecto, (Conceptualización, unos Ejemplos prácticos para la Formación de Formadores. CD Lima/Peru: SENATI

[Handlungsorientiertes Lernen und Projektmethode in der Aus- und Weiterbildung, ein zweisprachiges e-book mit Beiträgen (eine Auswahl):

APRENDIZAJE POR LA ACCIÓN, Lima, Berlin, 1999, 2) Juni 2001

Das Prinzip handlungsorientierten Lernens, Lima / Berlin, Juli 2001

Handlungsorientiertes Lernens einführen, Lima, Berlin, Juli 2001

Praxisbeispiele und Folienvorlagen u.a.

Eschborn: Eigenverlag GTZ, Abt. 41 - erschienen als CD, auch

<http://www.halinco.de/1/> (retrieved: 15.6. 2019).

Lindemann, H.-J. (2002). The principle of Action-Oriented Learning. In: Linking German TVET with Anglo-Saxon CBET, International Workshop. Weimar Februar 2002, Eschborn, Mai 2002: GTZ Verlag

Manpower International (2019) . “Talent shortages around the world”.

<https://go.manpowergroup.com/talent-shortage-2018#driversofshortage> Accessed 14 June 2019

Hernández, D. (2000). Competence-based Education and Training in México, (Sektorstudie Mexiko im Rahmen des Sektorprojektes CBT der GTZ). Buenos Aires und Santiago de Chile

Lindemann, H.-J. (1998). Desarrollo curricular en la Formación basado en Competencias, Aportes teóricos para la reforma de la formación técnico-profesional, (Beiträge zur Curriculumentwicklung in der kompetenzbasierten Berufsausbildung), TRANSFOTEP, Proyecto INET –GTZ. Buenos Aires: Eigenverlag GTZ - Cooperación Técnica Argentino-Alemana

Lindemann, H.-J. (2003). La tarea de trabajo y aprendizaje, SENATI “La Libertad”. Trujillo (Peru): SENATI - La Libertad, Verlag.

Lindemann, H.-J.& Tippelt, R. (2000). Schlüsselkompetenzen und berufliche Grundqualifikationen, Ausgewählte Aspekte und Grundlagen in: Lindemann, H.-J. (Hrsg.), *Deutsche Gesellschaft für Technische Zusammenarbeit: Competencias fundamentales, competencias transversales, competencias clave, aportes teóricos para la reforma de la formación técnico-profesional; [TRANSFOTEP, Proyecto INET-GTZ de apoyo a la transformación de la formación técnico-profesional]*, (S. 3–38). Buenos Aires: GTZ und INET

Manpower International (2019). Talent shortages around the world. Online:

<https://go.manpowergroup.com/talent-shortage-2018#driversofshortage> (retrieved 14.6.2019).

Peruvian Ministry of Labor and Employment Promotion -MTPS- (2018).Monthly report on the labour situation: "Peru, and how are we going?" No. 4(Informe mensual empleo privado Perú, ¿y cómo vamos? N° 4). Online:

https://cdn.www.gob.pe/uploads/document/file/234128/Informe_mensual_del_empleo_formal_privado_07-12.pdf (retrieved 14.6.2019)

SENATI (2017) Annual Memory 2016.

http://www.senati.edu.pe/sites/default/files/archivos/2017/publicaciones/09/senati_memoria_2016.pdf.

Accessed 14 June 2019

SENATI (2017a) Institutional magazine Nr. 80. February 2017,

https://www.senati.edu.pe/sites/default/files/archivos/2017/publicaciones/09/senati_revista_80.pdf,

Accessed 17 June 2019

SENATI (2018). Annual Memory 2017.

http://www.senati.edu.pe/sites/default/files/archivos/2018/publicaciones/04/memoria_2017.pdf,
Accessed 03 June 2019

SENATI (2019). Annual Memory 2018.

http://www.senati.edu.pe/sites/default/files/archivos/2018/publicaciones/04/memoria_2017.pdf,
Accessed 01 June 2019

Tippelt, R. & Amoros, A. (2000 a). Nuevas formas de enseñanza aprendizaje para la formación en la empresa (*New forms of teaching and learning for in-company training*). Lima: SENATI.

Tippelt, R. & Amoros, A. (2000 b). Diseño y desarrollo curricular (*Curriculum design and development*). Lima: SENATI.

Tippelt, R. & Amoros, A. (2000 c). Formación basada en competencias (*Competency-based training*). Lima: SENATI.

Tippelt, R. & Amoros, A. (2000 d). El método de proyectos en la formación profesional (*The project method in vocational training*). Lima: SENATI.

Tippelt, R. & Amoros, A. (2000 e): Formación de formadores orientada a la acción (*Training of trainers oriented to action*). Lima: SENATI.

Tippelt, R. & Amoros, A. (2000 f). Evaluación y Aseguramiento de la Calidad en Centros e Instituciones de Formación Profesional (*Evaluation and Quality Assurance in Vocational Training Centers and Institutions*). Lima: SENATI.

Vargas, F. (2004). Competencias clave y aprendizaje permanente. Tres miradas a su desarrollo en América Latina y el Caribe. Herramientas para la transformación 26. (*Key competences and lifelong learning. Three looks at its development in Latin America and the Caribbean. Tools for transformation 26*) Montevideo: ILO/Cinterfor.

Zúñiga, F. (1998). Las 40 preguntas más frecuentes sobre competencia laboral OIT/Cinterfor (Hrsg.) – erschienen zunächst als diskette 3,5 Zoll, Erstveröffentlichung als Buch 2004. Montevideo: Departamento de Publicaciones de Cinterfor/OIT. Hecho el depósito legal número 332.320 /2004

Author(s) Profile

→



M.A. Enrique Angles

Researcher

TU Dortmund University, Germany

E-mail: enrique.angles@tu-dortmund.de



Dr. Hans-Jürgen Lindemann

Expert and consultant in international VET cooperation

Senior consultant

LIN-CO Consulting, Germany

E-mail: hjl@halinco.de