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Professional Education and Training in the Leather-based Industries^{*}

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Explanatory Notes

AFLAI	AFRICAN FEDERATION OF LEATHER AND ALLIED INDUSTRIES
ALT	ACADEMY OF LEATHER TECHNOLOGY (Yogyakarta/Indonesia)
BLC	BRITISH LEATHER CENTRE (Northampton/United Kingdom)
CAD	computer-aided design
CAM	computer-aided manufacturing
CEC	CONFEDERATION EUROPEENNE DE L'INDUSTRIE DE LA CHAUSSURE = European Confederation of the Footwear Industry
CEFOTECA	CENTRO DE CAPACITACIÓN Y ASESORAMIENTO TECNOLÓGICO EN CAZADO (Argentina)
CERCAL	CENTRO RICERCA E SCUOLA INTERNAZIONALE CALZATURIERA (Italy)
CFC	common facility centre
CFTI	CENTRAL FOOTWEAR TRAINING INSTITUTE (Agra and Chennai/India)
CIM	computer-integrated manufacturing
CLRI	CENTRAL LEATHER RESEARCH INSTITUTE (Chennai/India)
CNC	computerized numeric control
COTANCE	CONFEDERATION DES ASSOCIATIONS NATIONALES DE TANNEURS ET MEGISSIERS DE LA COMMUNAUTE EUROPEENNE = Confederation of National Associations of Tanners and Dressers of the European Community
CSO	civil society organization
CSR	corporate social responsibility
CTC	CENTRE TECHNIQUE CUIR CHAUSSURE MAROQUINERIE (Lyon/France)
CTC/SENAI	CENTRO TECHNOLOGICO DO CAÇADO (Novo Hamburgo/Brazil)
ECTS	European credit transfer system
ESALIA	EASTERN AND SOUTHERN AFRICA LEATHER INDUSTRIES ASSOCIATION
EU	European Union
EURATEX	EUROPEAN APPAREL & TEXTILE ORGANIZATION
EVA	ethyl-vinyl-acetate
FAO	FOOD AND AGRICULTURAL ORGANIZATION OF THE UNITED NATIONS
FDC	FASHION AND DESIGN CENTER
FDDI	FOOTWEAR DESIGN AND DEVELOPMENT INSTITUTE (Noida/India)
GERIC	Grouping of Europe's Leather Technology and Training Centres
GMP	good manufacturing practice
GTZ	DEUTSCHE GESELLSCHAFT FÜR TECHNISCHE ZUSAMMENARBEIT GMBH (Germany)
HRD	human resource development
ICT	information and computer technology
ILO	INTERNATIONAL LABOUR ORGANIZATION
INESCOP	INSTITUTO ESPANOL DEL CALZADO Y CONEXAS (Elda/Spain)
IRDLAI	INSTITUTE FOR RESEARCH AND DEVELOPMENT OF LEATHER AND ALLIED INDUSTRY (Indonesia)
ISF	INTERNATIONAL SCHOOL OF FOOTWEAR – LEICESTER COLLEGE (United Kingdom)
ISMS	INTERNATIONAL SCHOOL FOR MODERN SHOEMAKING (Zlin/Czech Republic)
ITC	INTERNATIONAL TRADE CENTRE
IULTCS	INTERNATIONAL UNION OF LEATHER TECHNOLOGISTS AND CHEMISTS SOCIETY
LEFASO	VIETNAM LEATHER AND FOOTWEAR ASSOCIATION (Vietnam)
LLL	lifelong learning
LTC	LEATHER TECHNOLOGY CENTRE

MASFMT	Master of Advanced Studies in Footwear Management & Technology
NB	<i>nota bene</i> (remark)
NGO	non-governmental organization
NLDP	National Leather Development Programme (India)
OSH	occupational safety and health
PC	personal computer
PUR	polyurethane
PVC	polyvinyl-chloride
QA	quality assurance
ROI	return on investment
R&D	research and development
SED	special educational needs
SENAI	SERVIÇO NACIONAL DE APRENDIZAGEM INDUSTRIAL (Brazil)
SUPSI	SCUOLA UNIVERSITARIA PROFESSIONALE DELLA SVIZZERA ITALIANA (SUPSI) = University of Applied Sciences of Southern Switzerland (Manno/Switzerland)
TCL	textile, clothing and leather
TNA	training needs assessment
TQM	total quality management
TR or TPR	thermoplastic rubber
TVET	Training & Vocational Education & Training (project)
UITIC	UNION INTERNATIONALE DES TECHNICIENS DE L'INDUSTRIE DE LA CHAUSSURE = International Union of Shoe Industry Technicians
UNEP	UNITED NATIONS ENVIRONMENTAL PROGRAMME
UK	United Kingdom (of Great Britain and Northern Ireland)
UNCTAD	UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT
UN	UNITED NATIONS ORGANIZATION
UNDP	UNITED NATIONS DEVELOPMENT FUND
UNIDO	UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
USA	United States of America
VET	vocational education and training
vs.	<i>versus</i> (against, in opposition to)
[W]LAN	[wireless] local area network
~ or ≈	approximately
h	hour (= 60 min)
min	minute (= 1/60 h)
CHF	the monetary unit of Switzerland (€ 1.00 = CHF 1.48, US\$ 1.00 = CHF 0.69 in January 2010)
€ or EUR or Euro	the monetary unit of the EUROPEAN UNION
US\$ or USD	United States dollar (€ 1.00 = US\$ 1.45 in January 2010)

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EXECUTIVE SUMMARY

The *objective* of the study is to analyze the actual, fairly contradictors situation caused by economic changes in the past 3-5 decades, to review the most pressing problems – especially from developing countries point of view (where the bulk of leather processing and leather products manufacturing takes place presently) and to recommend principles and directions for [internationally] coordinated development in this field.

Professional education is normally integrated in the (general) education system of a given country and means regular personal development within formal conditions and provides certification documents testifying the achievement of the required knowledge standard. *Training* is understood as specific and targeted professional knowledge, skill and attitude development relevant to key functions to be performed by employees in leather products manufacturing. Needs for professional education and training are associated with the economic and technical development. The objective of training needs assessment (TNA) is to find discrepancies between competences required for performing jobs of a the [leather-based] industrial sector of actually employed workers and personnel. TNA is required when new facilities (institutions, curricula, courses, opportunities etc.) are established or when existing systems or their components are to be revised.

With the decline of leather and leather products manufacturing (i.e. due to less demand for skilled labour and specialists in this trade) in Nord America and Europe, as well as with rapid technology development (requiring more specific knowledge) related traditional professional educational structures gradually have practically disappeared, whereas similar organizations or services are still missing in South-East Asia (where the majority of leather and its derived products are manufactured today). Therefore, *importance of professional training* tuned for specific, up-to-date and very practical skills and knowledge has become high and now applied virtually everywhere. Lifelong learning (LLL) is an increasingly accepted and practiced tool of upgrading skills and upgrading knowledge that facilitates to comply with actual requirement in the production process. Professional education is today imparted by a wide range of providers (including R&D institutions, suppliers of material and technology, trade associations, fashion dictators etc.). On-the-job, short term, distant and internet-based types of training are gaining more popularity and prove their efficiency.

Development and application of professional education and training in the leather-based industry is associated with *conflicts* between relevant institutions and manufacturers regarding relevance and compliance with most modern processes, balance of theory and practice, geographic concentration of knowledge and main production centres, duration and timing.

There are certain *initiatives* efforts [being] made by several organization for enhancing matching to modern requirements professional training in the leather-related trade. Publications of unconventional approach appeared in various languages on leather processing and related pollution control, regional confederations of professional associations (e.g. COTANCE and CEC) developed novel training concepts and established new opportunities, web-sites providing e-learning, EU projects developing training curricula and methodology for new technology.

It is recommended to compile, keep updated and publish (electronically) training opportunities available for the leather-based industry, coordinate development efforts in this field, benchmark

available options (systems, contents, courses), encouraging and supporting the development of ICT supported methods.

INTRODUCTION

Professional training was on the agenda of the 13th *UNIDO Leather and Leather Products Industry Panel* meeting held in Bologna in 1997, but then only short reports were given on selected footwear training centres as good examples for establishing similar facilities in Africa. In contrast the present survey provides an overview of professional education and training in the entire leather value chain, i.e. in the leather processing and leather products (including footwear) industries, its actual status and future [trends].

The subject deserves special attention in the era when the leather-based industry, at least its manufacturing base is disappearing from industrialized countries (though the European Union, specifically Italy, Spain, Portugal and Romania try to reverse this trend), the share of formerly leading Latin American exporters (e.g. Argentina, Brazil) in the global trade is shrinking, whereas massive production capacities are emerging in developing countries (e.g. China, India, Indonesia, Vietnam) having no or little tradition in this trade. At the same time utilization of the extensive knowledge base and experience accumulated in professional education and training is not only seriously handicapped, whilst developing similar intellectual support services in South-East Asia would take quite some time.

Globalization opened avenues for internationalization of production of all kinds of goods. Earlier industries had built appreciable **traditions** (e.g. tanning in Argentina, Italy, Spain; footwear in Czech Republic/Czechoslovakia, Germany, Italy, Spain, UK; leather goods in Italy, France, Germany, Morocco; gloves in France, Romania; sports goods in Germany, Japan, UK, USA), but they are not sufficient to retain production capacities in their homelands. In parallel quite sophisticated institutional facilities (e.g. in ARS SUTORIA in Milan; CORWAINERS/London, NENE/Northampton, SOUTHFIELD/Leicester Colleges in UK, LGR/Reutlingen and FH-KL/Pirmasens in Germany) were established and gradually developed – many of them reaching international scopes. As a consequence of the globalization operation of quite some traditional (and not only leather-based) industries either has become uneconomic (e.g. due to high labour costs – as it happened in the textile- or leather-base trades) and/or lost their raw material base (e.g. raw hides in Argentina), actual production had to be moved to other (non-traditional) countries (e.g. Albania, China, South Korea, Tunisia, Vietnam). Furthermore, certain industrial activities may be preferred only for a relatively short period (e.g. some South Korea, Taiwan, Yugoslavia). In such cases appropriate institutional (including training) background had little chance to make a visible impact.

Range and characteristics of *materials, the process technology, ecological conditions* and *quality* appreciation of the globalized market all have altered not only substantially, but in certain respects (e.g. environmental protection, introduction of CAD/CAM/CIM, outsourcing) the changes are dramatic. We are witnessing an interesting paradigm: while new (artificial and synthetic) materials featuring far better (e.g. PUR for shoe soles, adhesives) and completely new properties genuine leather substitutes (e.g. membranes for shoe, glove and garment lining) have gained dominant applications, the societal desire for nature (natural origin) is increasing the demand for genuine leather in areas where it had a marginal role (e.g. car seats, furniture upholstery). Mechanization and subsequent automation brought about radical development in operations and the process technology, equipment, production control and management. With the constantly increasing quantitative demand (e.g. today the average footwear consumption is 5.5 pairs/capita/year in Europe and 7.1 pairs/capita/year in USA, as compared to around 3 pairs/capita/year half a century ago), ever in-

creasing influence of fashion (changes) and differentiation of functionality of leather products the meaning of quality is undergoing significant transformation. All these affect directly the structure of the leather-based industry, as well as modify substantially the knowledge (base) and skills required for manufacturing. As a natural consequence the professional education and training system, specifically its content, structure and the time allocated for preparing (key) operators, designers, technical and managerial staff for productive operations (enterprises, trade, support industries etc.) should also be adjusted to actual needs.

Science and technology have progressed a big way in the past decades, so had the general education system. At the same time leather-based industrial processes were refined and specialized (e.g. unit sole, shoe upper manufacturing), activities not directly incorporated in the process technology were separated (e.g. reblading, cutting die and mould making). These highly specialized operations employ professionals not associated with leather or its derived products technology, they are rather educated and specialized in respective areas (e.g. ecologists and/or environmental specialists in tannery pollution control, chemists in heel and unit sole).

Finally social environment, pedagogy and educational practice, information and communication technology (ICT) [should] make also visible impact on the present status of professional education and training applicable for leather- and leather products manufacture. Conventional training/teaching/learning methods and routinely suggested course durations, forms and arrangements suit neither today's (to be) employees and industrial operations. This is a fairly strong argument for initiate a reform in leather-based professional education and training systems and practice.

The **objective** of the present study is to analyze the actual, fairly contradictory situation caused by the above factors; review the most pressing problems – especially from developing countries point of view (where the bulk of leather processing and leather products manufacturing takes place presently), initiate organized and coordinated thinking, as well as recommend actions that would initiate a reform in this area. The emphasis is on international approach and cooperation, with special references to the role of multinational organizations and UN [specialized] agencies in assisting developing countries. However, for obvious constraints (such as time and other resources) this study is *not* offering solutions to this highly complex problem area.

TERMINOLOGY

Pedagogy vs. Industry

Pedagogy¹ is the science of teaching, involving the study of human learning process and the application of learning principles to the development of educational goals and curricula and to teaching situations.² Generally the term pedagogy refers to the science or theory of educating; trainee teachers learn their subject and also the pedagogy appropriate for teaching that subject. The Latin-derived word for pedagogy: *education*, is in modern times used in the English-speaking world to refer to the whole context of instruction, learning, and the actual operations involved therein, although both words have roughly the same original meaning.

One of the major composite elements of pedagogy is **didactics**: the activities of educating or instructing; activities that impart knowledge or skill.³ At the same time didactics is the theory of teaching and, in a wider sense, the theory and practical application of teaching and learning.⁴

Industrial training is largely associated with developing skills of adults as normally incumbents are involved earliest⁵ at their adolescent or teenager age. **Andragogy** (from Greek “man-leading”) consists of learning strategies focused specifically on adults. It is often interpreted as the process of engaging adult learners with the structure of learning experience.⁶ According to *M. Knowles*⁷ adopter of the basic theory of andragogy is based on the following assumptions:

1. Adults need to know the reason for learning something (Need to Know).
2. Experience (including error) provides the basis for learning activities (Foundation).
3. Adults need to be responsible for their decisions on education; involvement in the planning and evaluation of their instruction (Self-concept).
4. Adults are most interested in learning subjects having immediate relevance to their work and/or personal lives (Readiness).
5. Adult learning is problem-centered rather than content-oriented (Orientation).
6. Adults respond better to internal versus external motivators (Motivation).

Already ancient and medieval craftsmen societies, the **guilds** had a well organized system for bringing up the new generation (their own successors). The guild was made up by experienced and confirmed experts in their field of handicraft. They were called master craftsmen. Before a new employee could rise to the level of mastery, he had to go through a schooling period during which he was first called an *apprentice*. After this period he could rise to the level of journeyman.

¹ Etymologically the word pedagogy comes from the Greek παιδαγωγέω (paidagōgēō); in which παῖδ (paíd) means “child” and ἄγω (ágō) means “lead”; so it literally means “to lead the child”. – <http://en.wikipedia.org/wiki/Pedagogy>

² The New Encycloædia Britannica (15th Edition). ENCYCLOÆDIA BRITANNICA, INC. Chicago, 1984.

³ <http://www.thefreedictionary.com/didactics>

⁴ http://en.wikipedia.org/wiki/Didactic_method

⁵ Unfortunately child labour is still used in industry, services and/or agriculture in some parts of the World and as such very young children are being trained to certain jobs. However, as modern societies with UNITED NATIONS in the forefront are against employing children, as a matter of principle this particular aspect of professional education and training is will not be mentioned in this paper.

⁶ <http://en.wikipedia.org/wiki/Andragogy>

⁷ *Malcolm Shepherd Knowles* (1913-1997) was an American adult educator, famous for the adoption of the theory of **andragogy**– initially a term coined by the German teacher *Alexander Kapp*.

Apprentices would typically not learn more than the most basic techniques until they were trusted by their peers to keep the guild's or company's secrets.⁸

The modern industry (of the new age, i.e. from the industrial revolution time in 18th and 19th centuries), especially larger industrial companies usually had specific programmes and most of them established special departments or schools within their own facilities or under direct control of the enterprise for training their skilled workers. Trainees normally came directly from elementary or basic schools (desirably after successful completion). This type of skill development is in fact *professional education*. With technical development and formation of knowledge-based industries (e.g. information and computer technology – ICT, biotechnology), as well as with secondary education becoming compulsory (in most of industrialized countries), the starting age when young people entered in industrial education has gone up to 16-18 years.

Pedagogy/Andragogy Related Terms

The **school**⁹ is an establishment in which children are given formal education.¹⁰ It is an institution designed to allow and encourage students (or “pupils”) to learn, under the supervision of teachers.¹¹

In the context of this paper an **institute**¹² is a society or organization for the promotion of a scientific, educational etc. object; the building used by such a society or organization.¹⁰ The **institution** is the action or an act of instituting something; the fact of being instituted.¹³ Institutes or institutions may established for a wide range of activities, however, most frequently they deal with research and development (R&D), education and training – i.e. knowledge and human development.

The **student** is a person following a course of study and instruction at a university, college etc.¹⁰, but in practice this term usually applied to those undergoing higher education. Although the broad meaning of the **pupil** is “a person being taught by another; especially a schoolchild or student in relation to a teacher”¹⁰, today it covers schoolchildren undergoing primary (elementary, basic) and secondary (general) education within an established system (of a country). A **trainee** is a person undergoing training (see below). **Apprentices** (or in early modern usage “prentices”) or protégés¹⁴ build their careers from *apprenticeships*: a system of training a new generation of practitioners of a skill. Most of their training is done on the job while working for an employer who helps the apprentices learn their trade, in exchange for their continuing labour for an agreed period after they become skilled. Theoretical education may also be involved, informally via the workplace and/or by attending vocational schools (see later in the study) while still being paid by the employer.¹⁵

⁸ <http://en.wikipedia.org/wiki/Guild>

⁹ Etymologically the word **school** comes from Greek σχολή (*scholē*), originally meaning “leisure” and also “that in which leisure is employed”. – <http://www.etymonline.com/index.php?term=school>

¹⁰ The Concise Oxford Dictionary (*Eight edition*). © OXFORD UNIVERSITY PRESS, 1990.

¹¹ <http://en.wikipedia.org/wiki/School>

¹² The word institute comes from the Latin *institutum* meaning *facility* or *habit*; from *instituere* meaning *build*, *create*, *raise* or *educate*.

¹³ <http://en.wikipedia.org/wiki/Institute>

¹⁴ **Protégé** means **mentorship** and refers to a personal developmental relationship in which a more experienced or more knowledgeable person helps a less experienced or less knowledgeable person. –

<http://en.wikipedia.org/wiki/Prot%C3%A9g%C3%A9>

¹⁵ <http://en.wikipedia.org/wiki/Apprenticeship>

Teaching is the process of *imparting information or knowledge* to (a person); educating, training or instructing (a person); giving (a person) moral guidance. It also means to enable (a person) *to do* something by instruction or training; show or explain to (a person) a fact or how to do something by instruction, lessons etc. **Learning** is the process of *acquiring knowledge* of (a subject) or skill in (an art etc.) as a result of study, experience, or instruction; acquire or develop an ability *to do*. It also means to become acquainted with or informed of (a fact); hear (*of*), ascertain.¹⁰ Learning is acquiring new knowledge, behaviors, skills, values, preferences or understanding, and may involve synthesizing different types of information. Progress over time tends to follow learning curves. Human learning may occur as part of education; it may be goal-oriented and may be aided by motivation (see later in this chapter).¹⁶

The **teacher** is person who or thing which teaches or instructs; an instructor; especially a person employed to teach in a school. The terms **lecturer** and **professor** are normally used for teachers of the higher education (system).¹⁰ The **trainer** is person who trains or *instructs* a person or animal; an instructor; a person who trains athletes, footballers, racehorses etc., as a profession. The trainer may also be a piece of equipment used for training; an exercise machine (e.g. simulators).

Education vs. Training

Educate/education, teach[ing], train[ing], school, instruct[ion], tutor, inform[ation] are used in everyday and even in professional (pedagogical) life and literature as fairly close synonyms (i.e. words having the same general sense or denoting the same thing as another) – of course, having a different emphasis or appropriate to a different context. Moreover, phrases such as *coach[ing], enlighten, edify, rear, indoctrinate, illumination* have also similar meanings, though they are used less frequently and mostly in specific contexts. In any event all of them are directly associated with **development** and **improvement** (of knowledge and personal qualities).

The broadly expected definitions of the word **educate**¹⁷ (as a verb) are as follows:

- ✓ Bring up (children) so as to form their habits, manners, intellectual aptitudes, etc.¹⁰
- ✓ Train so as to develop intellectual or moral powers generally, or in a particular mental or physical faculty; instruct, discipline.¹⁰
- ✓ To bring up (as child or animal).¹⁸ To develop (as a person) by fostering to varying degrees in growth of expansion of knowledge, wisdom, desirable qualities of mind or character, physical health, or general competence especially by formal study or instruction.¹⁷
- ✓ To train by formal instruction and supervised practice especially in a trade, skill or profession.
- ✓ To provide with information.¹⁷
- ✓ To bring about an improvement in or refinement of one of the most important arenas for the exercise of intelligence).¹⁷
- ✓ To make (as a person) competent in the handling of or in dealing with by preparation, discipline with by preparation, discipline or expansion of knowledge or competence.¹⁷

¹⁶ <http://en.wikipedia.org/wiki/Learning>

¹⁷ Etymologically **education** comes from Latin *educatus*, of *educare* “bring up, rear, educate”, which is related to *educere* “bring out,” from *ex-* “out” + *ducere* “to lead”. The meaning “provide schooling” is first attested 1588 in Shakespeare. – http://wiki.answers.com/Q/WHAT_IS_THE_etymology_of_the_word_educate.

¹⁸ Webster’s Third New International Dictionary of the English Language. ENCYCLOPEDIA BRITANNICA, INC., Chicago, 1981.

Education is the *process* of bringing up children in particular manners, habits or ways of life. Another definition suggests that education is the systematic instruction, schooling or training of children and young people or, by extension, instruction obtained in adult life; the whole course of such instruction received by a person.¹⁰ Education in its broadest sense is any act or experience that has a formative effect on the mind, character or physical ability of an individual. In its technical sense education is the process by which society deliberately transmits its accumulated knowledge, skills and values from one generation to another.¹⁹

Professional education is specifically tuned or oriented to generating specialists of a given profession. In turn a *profession* is a vocation founded upon specialized educational training, the purpose of which is to supply disinterested counsel and service to others, for a direct and definite compensation, wholly apart from expectation of other business gain.²⁰ Finally the *vocation*²¹ is a term for an occupation to which a person is specially drawn or for which they are suited, trained or qualified.

Traditionally the term **train**²² (as a verb) has [slightly] different meaning than education as described below:

- ✓ Originally to provide (soldiers) with military discipline; drill. Now, instruct in or for a particular skill, profession, occupation, etc., especially by practice or practical experience; make proficient by such instruction and practice. Also, make (the mind, eye etc.) sharp and discerning as a result of instruction, practice etc.
- ✓ Control or direct so as to bring to a required form; specifically cause (a plant or branch) to grow in a desired shape, manner, or direction, esp. against a wall or up a trellis.¹⁰
- ✓ Provide (esp. a young person) with a moral and disciplined upbringing; educate, rear.¹⁰
- ✓ To draw by artifice or stratagem.¹⁷

Training is the action of train, the act or process of providing or receiving instruction in or for a particular skill, profession, occupation etc.¹⁰ The teaching, drill or discipline by which power of mind or body are developed.¹⁷ Organized activity aimed at imparting information and/or instructions to improve the recipient's performance or to help him or her attain a required level of knowledge or skill.²³ Training may also be considered as the process of bringing a person etc., to an agreed standard of proficiency etc. by practice and instruction.²⁴

Retraining is the process of learning a new skill or trade, often in response to a change in the economic environment. Generally it reflects changes in profession choice rather than an "upward" movement in the same field.²⁵ Nevertheless, retraining may also be required for refreshing knowledge, regaining confidence or refining (especially manual) skills or to eliminate bad habits.

Even if a well structured and functioning professional education system exists in a given country or region training in specific areas is required because

¹⁹ <http://en.wikipedia.org/wiki/Education>

²⁰ <http://en.wikipedia.org/wiki/Profession>

²¹ Etymologically the word **vocation** comes from the Latin *vocare* meaning "to call".

²² Etymologically the original meaning of **train** was "instruct, discipline, teach" 1540s, from *train* (*noun*), probably from earlier sense of "draw out and manipulate in order to bring to a desired form" (late 14th century). –

<http://www.etymonline.com>

²³ <http://www.businessdictionary.com/definition/training.html>

²⁴ <http://www.thefreedictionary.com/training>

²⁵ <http://en.wikipedia.org/wiki/Retraining>

- ✓ technology and production management systems are changing (developing);
- ✓ some jobs/activities need only short but focused training;
- ✓ additional skills and knowledge are needed;
- ✓ newcomers and those having education or experience in other trades should obtain specific needs.

Further to comparing and analyzing the above quoted definitions of education and training (minimum) two specific conclusions can be made:

- a) terms education and training cover essentially very similar domains, namely developing knowledge, skills, attitudes, behavior etc. of (but not only) the human being;²⁶
- b) at the same time education is more (but not only) concerned with formal [theoretical, mental] knowledge and the process of building it up, whereas training is more (but certainly not exclusively) associated with [practical, manual, physical] skills and the process of improving and/or making them [near to] perfect.

As far as industrial education and training are concerned, a [slight] distinction has been adopted in professional literature. *Education* is normally applicable to formal and chiefly school (institution, college, university) based knowledge development done on a continuous manner (every day), usually at early ages for obtaining certain qualification (profession, diploma/certificate, degree). *Training* is concentrating on developing skills (including stamina) required for performing some specific tasks or jobs; it is done in shorter time and mostly as part of or for some selected workplace (operation, machine, process etc.).

In the context of this paper (professional) training is clearly distinguished from (professional) education the following manner:

- **Professional education** (or **education** in short) is normally integrated in the (general) education system of a given country that means regular, systematic personal development within formal conditions (schools, colleges, universities) and provides legally stipulated certification documents (diplomas, degrees) testifying the achievement of the required knowledge standard. Education is organized in a hierarchical structure of various schools and usually lasts several years in one (level of) of the educational institutions.
- **Professional training** (or **training** in short) is understood as specific and targeted professional knowledge, skill and attitude development relevant to key functions to be performed by employees (including direct labour, technical and managerial staff) and entrepreneurs in leather products manufacturing. Usually training is built on and supplements certain level of [technical] education. However, **re-training** refers to repeated or continuing skill/knowledge development of already educated or earlier trained employees.

²⁶ This may be seen in many other languages, where one word is used – especially in everyday communication – for all kind of knowledge and skill development (e.g. *formation* in French, *formazione* in Italian, *formación* in Spanish, [Aus] *Bildung* in German, *образование* or *учить[ся]* in Russian).

Forms of Training

The best known and most frequently used form of training is a **course** organized for a group²⁷ of interested (or assigned) people (trainees). In this case teachers, instructors, speakers present, demonstrate and explain the subject matter, the audience is expected to take it over (remember, absorb, understand, exercise) it. In case of a *lecture* the topic is presented to participants. *Courses* are series of knowledge passing and skill developing activities that may combine lectures, practical exercises, home or project work, feedbacks etc. Although good teachers/instructors and well-prepared training materials, as well as organized feedback facilities (test, examinations) may improve efficiency of courses, this form of training is a “one-way” knowledge transfer.

Workshops also involve a group of people, but these are based on sharing knowledge and/or experience of brought by – ideally all – participants. There may be a lecturer or a keynote speaker introducing the subject and formulating the problem that is expected to be solved (at least partially) by the group.

The *seminar* is essentially a place where assigned readings are discussed, questions can be raised and debates conducted. The *symposium* is an academic conference. *Meetings* may be educative for some participants or even the entire group, but their objective is more information exchange (though sometimes they turn into workshops) and not increasing the knowledge or developing skills of participants.

In **distance education or learning** knowledge, information and feedback are communicated between trainers and trainees without meeting each others on person (they are not “on site”). Communication is made through electronic media or through technology that allows them to communicate in real time.

Individual or self-training means that each trainee (individually) obtains new knowledge and/or develops certain skills without other persons’ (let alone trainers’) direct assistance. The source of knowledge and instructions for skills development may be any traditional teaching materials such as [text]books, still and motion pictures, as well as modern tools like simulators, games, guiding devices etc. Series of checking questions, tests, performance indicators (e.g. time, quality) provide for measuring progress and success of the learning process: they are feedbacks for the trainee himself or herself. Programmed teaching materials (may be on any media) add flexibility to learning: they may take different course in the knowledge/skill development depending on the feedback and success rate.

The **curriculum** is all the courses of study offered by an educational institution, as well as group of related courses, often in a special field of study²⁸ (e.g. tanning technology, footwear design, production management, marketing).

Experience is an important factor in labour-intensive and especially traditional activities such as leather-based industries. [Working] experience may be defined as:

- ✓ Actual observation of or practical acquaintance with facts or events, considered as a source of knowledge.¹⁰

²⁷ Seldom individuals may also be trained: it is special form of the course with one only trainee, otherwise the training process is largely the same.

²⁸ <http://www.thefreedictionary.com/curricula>

- ✓ The state of having been occupied in any branch of study or affairs; the extent or period of such an occupation; the aptitudes, skill, judgment etc., thereby acquired.¹⁰
- ✓ Active participation in events or activities, leading to the accumulation of knowledge or skill; the knowledge or skill so derived and/or accumulated.²⁹

These definitions prove that practical or working experience is an effective source of knowledge and especially acquiring or refining skills. In reality traditional apprenticeship until early 19th century was built on developing practical experience and today's practice of on-the-job training (of semiskilled workers) uses also this technique.

Personal Capabilities

[Professional] Education and training aims at developing certain personal capabilities that would then contribute to productivity of the process (technology) and quality of the product in which incumbents intend to participate (i.e. work).

Abilities of a particular person depend on his/her talent (deposition of mind or character, inclination for something, natural endowment or ability, gift, aptitude) that is believed to be genetically determined and acquired skills (ability to do something, knowledge, proficiency, expertness) that may be developed by appropriate education and *training*. The following terms are closely associated with abilities of people:

- Everybody is born with a fairly wide range of abilities (e.g. manual dexterity, logical thinking, memory etc.). They form a potential to be converted into **skills** by targeted, focused and motivated development processes using exercises that enhance (increase, widen, speed etc.) skill(s). This process is named training, which may be imparted by and/or in educational organizations (e.g. schools) or through specifically organized training courses/exercises (e.g. on-the-job training) or by the person himself or herself (self-training).
- **Capability** is a set of abilities and skills, power or fitness for some purpose or activity.
- **Capacity** is the ability to receive, contain, hold, produce or carry. Normally this term is used to express quantitative aspects of capabilities, while the latter expresses the availability of required abilities.
- **Competency** is the physical, mental, financial and/or legal power to perform (e.g. an operation, job); the state or quality of being adequately or well qualified; a specific range of skills, knowledge, abilities or a given combination of thereof.
- **Qualification** originally meant competences, but in today's speech (especially in administration) it is a set of learned or acquired skills and knowledge acknowledged, tested, testified and most importantly proven by (written) certificate (diploma, license).

Motivation is the activation or energization of goal-oriented behavior. It is of particular interest because of the crucial role it plays in student learning, as well as it is an important element in the concept of andragogy (what motivates the adult learner).³⁰

²⁹ <http://www.thefreedictionary.com/experience>

³⁰ <http://en.wikipedia.org/wiki/Motivation#Applications>

Benchmark(ing)

Benchmarking is a widely used term today as a synonym for comparing or commensuring [similar] objects, systems, practices etc. In order to maintain clarity and consistency of understanding, related terms will be used according to the following definitions within the context of this survey:

- **Benchmark** is a close to optimum standard or guideline, which is of fairly universal application and which is well tested.
- **To benchmark** refers to the practice of an organization or company measuring itself against a group of reasonably comparable similar entities.
- **Good manufacturing³¹ practice (GMP)** is a guideline to high standards of operating for a large number of organizations (including companies), but it may not be universally applicable. GMP has been chosen advisedly rather than the other commonly used expression “best practice”.
- **Bench learning** is the highly targeted approach to performance improvement when an organization or company tries to measure itself against other highly successful operations.

Benchmarking, good practice and bench learning are all *activities* of a related kind, which are used to answer the following questions:

- “How do you know that your operation is efficient?”
 - “If it is not as efficient as it could be what you can do to make an improvement.”
 - “Knowing that your operation is not efficient and not doing something about it is not very helpful.”

Industry Sectors

The **leather-based industry** encompasses the entire *value chain* from flaying hides and skins³² (as byproducts of the meat processing industry) to producing consumer goods made of genuine leather (or substitutes). Usually the leather derived products manufacturing is listed among *light industries*. Since the basic material (raw hides and skins) comes from agriculture, the terminology of the UNITED NATIONS ORGANIZATION (UN) and many Governments this sector is listed under *agro-based industries*.

There are three phases of processing hides and skins into derived consumer products:

- *hides and skins handling and improvement* deals with flaying, preservation, collection and transport of the raw material;
- *leather processing* or *tanning* converts raw hides and skins into stable, durable, hygienic and aesthetic semi-finished (wet-blue, crust) or finished genuine leather;
- *leather products* manufacturing supplies footwear (shoes), leather goods (e.g. handbags, travel goods, small or flat goods, belts), gloves, leather garment, upholstery (including car seats), sports goods (e.g. balls), saddles and harness, technical articles (e.g. belts).

³¹ Since the present document is concerned with training and related issues this term could have been used in its simplified form “good practice”. Nevertheless, to ensure coherence with industrial applications and to stress the practical feature (and applicability) it was decided to keep the phrase “manufacturing” in the denomination and its abbreviation.

³² *Hides* of cattle, horses, camels, dears and *skins* of sheep, goats, pigs, peccaries, reptiles (crocodiles, lizards, snakes etc.), fishes (e.g. sharks, Nile perch), ostriches are prime raw material sources.

The overall structure of the leather-based industry is illustrated on *Figure 1*.



Figure 1

The leather-based industry value chain

The structure presented on *Figure 1* may be considered as the internal value chain of the sector. The global or full **value chain** would include:³³

- (i) *support industries*: leather substitute (textile, rubber, plastic, artificial and synthetic leather including poromerics) producers, chemical (e.g. tanning and finishing agents, adhesives) suppliers, equipment (including CAD/CAM) manufacturers, tool (e.g. shoe last, cutting die, mould) makers etc.;
- (ii) *by-products manufacturing*: e.g. utilization or conversions of wastes;
- (iii) *environmental protection*: pollution control such as effluent treatment, safe disposal of solid wastes etc.;
- (iv) *trading*: material supply, wholesale and retail channels;
- (v) *services*: marketing, logistics, maintenance, testing and quality assurance (QA), research and development (R&D), professional education and training.

These activities may be part of the core operation (enterprise), but the tendency is to out-source or purchasing them.

³³ Product development (including design), management and administration are considered as integral parts of the core operation. However, more and more of such activities are being sourced (e.g. bookkeeping and legal support from specialized services, product development from studios, marketing or even production supervision from marketing partners).

The present survey focuses on the dominant leather processing and leather products manufacturing subsectors, namely on **leather processing** (tanning), **footwear**, **leather goods**, **gloves** and **leather garment** production, whereas others (will only be mentioned if and where relevant information on related education or training is available).

One of the main and characteristic features of the leather- and leather products industries has been that the companies belonged to *small- and medium-scale industries (SME)*. Although in the 20th century several large-scale enterprises operated chiefly in industrialized countries, but even they (with the perhaps only exception of BATA) had relatively small-sized plants in different locations (towns/countries), the overwhelming majority of tanneries, shoe and other leather products manufacturers were SMEs. Moreover, artisans dominating developing countries' leather-based industries were rather micro enterprises employing 2-15 workers. While the bulk of European, African and Latin-American operations remained, the overall picture is rapidly changing by outsourcing production to [South-East] Asia where (especially in China and Indonesia) factories have several thousand employees.³⁴

For a long time leather-based industries were known for high involvement of manual work. Since late 19th century with the mechanization of the process leather manufacturing has become an *investment intensive* operation. Recent stringent requirements regarding environmental protection tanneries (or their clusters) need to install quite sophisticated pollution control facilities that are associated with further investments in infrastructure. In contract leather products manufacturing remained *labour intensive* operation where [manual] skills and labour costs play a significant role.

³⁴ The largest known footwear manufacturing plant employs 90,000 workers in China.

EDUCATIONAL AND TRAINING NEEDS

Needs for Professional Educational

Needs in educated [at a given level] people are influenced by two major factors: requirements and/or objectives/plans of the society and its foreseen/expected demand for given qualifications.³⁵ In case of professions of more general or convertible character (e.g. humanitarian sciences) the dominance of the society is obvious, whereas the economy (including business and industry) determines the demand for specially educated professionals (e.g. engineers).

Professional education (schools) should *aim* to produce new recruits to the profession who, at the completion of their training, have a sufficient level of knowledge and skills to enter practice and the profession will ensure thereafter that its standards are maintained.³⁶ This suggests that professional education should not be static in the sense of just harness incumbents with knowledge of (desirably actual and most up-to-date) technology, but they should also possess abilities enabling them to adapt to changing conditions, acquiring new knowledge and skills even if that requires (at a later stage and probably several times) additional education and/or training. Nowadays technology is changing so fast that knowledge acquired in professional education (even that of the highest level and quality) professionals will need to learn about new materials, methods, processes and even principles during their professional career. In practice this necessitates (frequent) retraining.

Another reason generating needs for undergoing new or supplementary education is the ever changing [economic, technical, personal and/or social] environment that may cause

- increase of productivity (e.g. by mechanization, automation);
- shrinkage of certain (sub)sectors or activities (e.g. outsourcing manufacturing processes);
- radical change in technology that eliminates professions (e.g. horse car driving, typewriter technician);
- introduction of new professions (e.g. computer programming).

These generate unemployment in respective industrial areas or generate new jobs requiring entirely new skills. Moreover, one should not forget personal motives when individuals want to leave their learnt profession and enter into other engagements. All these may also initiate retraining.

Lifelong learning (LLL) is the “lifelong, lifewide, voluntary, and self-motivated” pursuit of knowledge for either personal or professional reasons. As such, it not only enhances social inclusion, active citizenship and personal development, but also *competitiveness* and *employability*.³⁷ Professional education may offer an ongoing programme known by a variety of terms, e.g. in-service, post-basic, continuing education. An aim of professional education is not professional development se but increasing the learner’s critical awareness so that (s)he develops in those aspects of his life that relate to professional practice and which are relevant to lifelong education.³¹

³⁵ Of course, these two factors may well be interrelated depending on the political setup/objective, as well as the governance system (Government) of the society.

³⁶ P. Jarvis: Professional Education. CHROOM HELM LTD., Beckenham, 1983.

³⁷ Adult learning: It is never too late to learn. COMMISSION OF THE EUROPEAN COMMUNITIES. – COM(2006) 614, Brussels, 2006.

As mentioned above needs for professional education³⁸ are associated with the (assumed or planned) economic and technical development. In principle or theoretically the *volume* of professionals to be educated (produced) annually for a functioning industrial subsector may be a by taking the number of old professionals (including those with extensive experience) due to retire in the given calendar year and correct this number with the trend in production (expected increase/decrease), the rate of succession (what percentage is falling out during the educational period) and the proportion of graduates remaining in the trade. However, such an approach features fairly low reliability as it does not take into account technical development that would influence quantities, range and kind of functions (i.e. content of knowledge and kind of skills) of employees in the *future* technology or production process. Another factors to be taken into consideration include intake of specialists with (more) general or other specialization, as well as number of earlier employed professionals that leave the industry (for whatever reasons).

Practice of a large number of countries and various economies show that taking industry (e.g. trade associations') requests without criticism provides not much more reliable estimate either. The reason being is that (i) manufacturing companies tend to exaggerate their quantitative needs in educated personnel as they normally do not contribute directly to costs of the education and (ii) if they could they would employ staff with the highest possible educational background even for lower grade jobs.

It is relatively simple to estimate needs in professional education for newly established industrial estates or parks that are usually set up when production (plants) are relocated.³⁹ In such cases usually well defined plans are available with detailed project documentations on plants to be built in the given estate or cluster. These documents contain plant layouts, as well as specifications of jobs (often with job descriptions that define required [professional] knowledge and skills) and implementation schedules.

Training Needs Assessment (TNA)

There are several **definitions** of TNA found in the international literature. The following lists definitions express best the intention of the present project:

- The training needs survey measures what skills employees have, what they need, and how to deliver the right training at the right time.
- Needs assessment is performed to determine what training will successfully address any skill deficits.
- A needs assessment is a systematic investigation of an audience(s) to identify aspects of individual knowledge, skill, interest, attitude and/or abilities relevant to a particular issue, organizational goal, or objective.
- Needs assessment is used for identifying gaps and to provide information for a decision on whether the gaps could be addressed through training. The assessment is part of a planning process focusing on identifying and solving performance problems. These performance problems may be related to knowledge, skills and attitudes.
- TNA is a tool utilized to identify what courses or activities should be provided to employees to improve their work productivity. Focus should be placed on needs as opposed to desires.

³⁸ This should be distinguished from *special educational needs* (SEN) as the latter refers to provision of specific education to [partially] disabled people or other minorities (e.g. immigrants).

³⁹ Such relocations are taking place either for environmental protection reasons (e.g. tanneries) or as a consequence of massive outsourcing of manufacturing activities.

- ✓ *Needs are gaps* – the space between what currently exists and what should exist.
- ✓ *Wants are solutions* – a proposed means to filling the gap.

TNA **objective** is to find discrepancies (if any) between competences required for performing jobs (tasks) of a given (industrial) sector or manufacturing process or other types of organizations and capabilities of actually employed workers and personnel.

The TNA process and its relation to the target structure (system or organization) is illustrated on *Figure 2*.

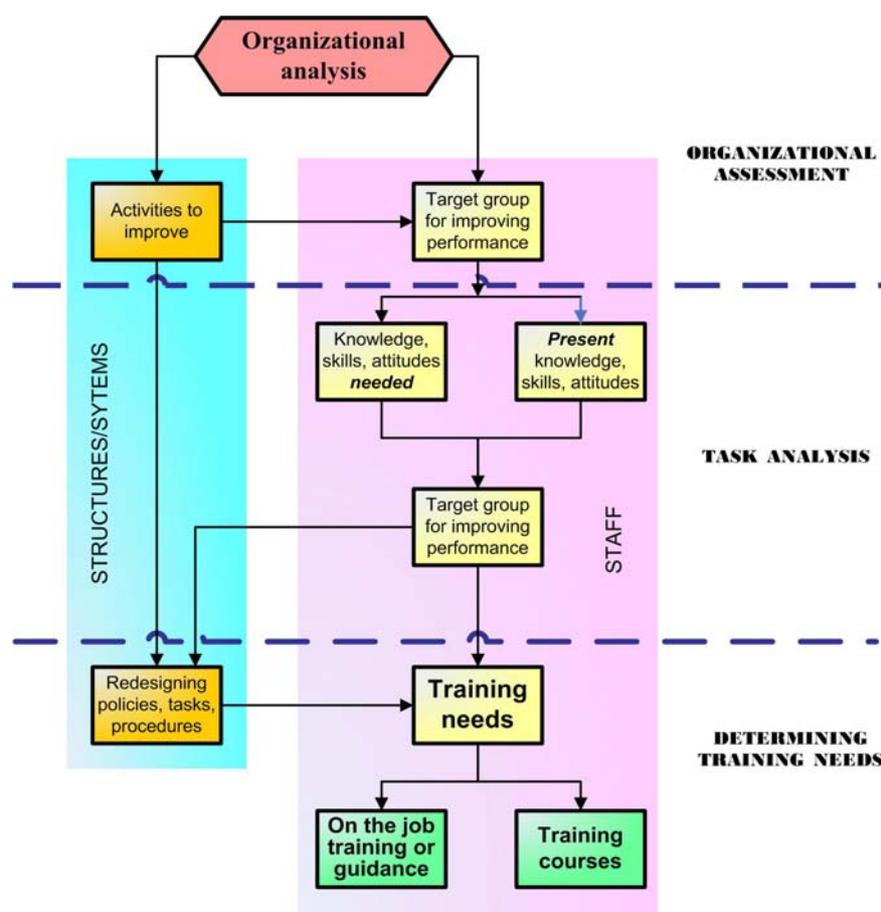


Figure 2
TNA process

TNA Methods

TNA may be conducted by several ways (see below) but in reality an optimal mixture of these **methods** are used:

- ❖ *Context analysis.* An analysis of the business needs or other reasons the training is desired. The important questions being answered by this analysis are who decided that training should be conducted, why a training program is seen as the recommended solution to a business problem, what the history of the organization has been with regard to employee training and other management interventions.

- ❖ *User analysis.* Analysis dealing with potential participants and instructors involved in the process. The important questions being answered by this analysis are who will receive the training and their level of existing knowledge on the subject, what is their learning style and who will conduct the training?
- ❖ *Work analysis.* This is an analysis of the job and the requirements for performing the work. Also known as a task analysis or job analysis, this analysis seeks to specify the main duties and skill level required. This helps ensure that the training which is developed will include relevant links to the content of the job.
- ❖ *Content analysis.* Analysis of documents, laws, procedures used on the job. This analysis answers questions about what knowledge or information is used on this job. This information comes from manuals, documents, or regulations. It is important that the content of the training does not conflict or contradict job requirements. An experienced worker can assist (as a subject matter expert) in determining the appropriate content.
- ❖ *Training suitability analysis.* Analysis of whether training is the desired solution. Training is one of several solutions to employment problems. However, it may not always be the best solution. It is important to determine if training will be effective in its usage.
- ❖ *Cost-benefit analysis.* Analysis of the return on investment (ROI) of training. Effective training results in a return of value to the organization that is greater than the initial investment to produce or administer the training.
- ❖ *Training audit.* Provides organizations with an overview of the effectiveness and efficiency of its training/learning function. The purpose of the training audit is to identify the strengths and weaknesses of the training/learning function in terms of its current responsibilities and future commitments. Since every organization is unique, each training audit is customized to meet the specific learning needs and requirements of each situation. At the conclusion of a training audit, the department will receive a report card with detailed findings and recommendations.

TNA is always based on actual data collected in the target area and/or from target beneficiaries (e.g. potential or present employees, entrepreneurs or managers). The following list overviews most frequently used TNA **data collection methods**.

- ◆ *Observation* is a method of data collection based on watching a process or skill and systematically recording the events.
- ◆ *Interviews* mean one or more series of active interchanges between two or more people. They can be conducted either face to face or via technology.
- ◆ A *focus group* is an interactive exchange between an interviewer/facilitator and a group of people. Typically the discussion is guided by the facilitator according to a preplanned set of questions.
- ◆ *Oral surveys* are an interview where closed questions are used in order to elicit “yes” or “no” answers to a set of preselected questions.
- ◆ *Questionnaires* are a survey instrument through which individuals respond to printed or electronic (e.g. via internet) questions.
- ◆ Analysis of *existing data* mean looking at information already gathered by the organization.
- ◆ A *test* means simply an examination that assesses knowledge or skill level.

It is also obvious that observation, interviews, focus groups, oral surveys and tests have a lot common insofar they all would need some kinds of outlines or plans that may be very similar to a questionnaire. Nonetheless, questionnaires as survey tools have undisputable *advantages* such as generation of well documented databases, concentrated scope, low cost (especially in the present electronic communication era), speed etc. At the same time this type of instrument has also some

disadvantages like [usually] low return and incomplete responds, absence of verification or validation of supplied data, biased or prejudiced answers, manual work required in summarizing and analyzing data (at least in data input for computerized processing).

An example of a fairly comprehensive questionnaire prepared for leather products industries is presented in *Annex I*. It features following characteristics:

- It is suitable for collecting information from footwear, leather goods and other leather products manufacturers. However, the dominance of shoe production within all leather products (in the majority of countries) makes it unavoidable to include areas specific to this trade and list examples and alternatives characteristic to shoemaking. Nevertheless a great deal of this questionnaire may well be used for TNA of leather processing.
- The size (volume) is concise and makes it acceptable for and secure cooperation of interviewed company representatives.⁴⁰
- Defines training-related questions in a way that answer could be easily and quickly (e.g. in form of pre-defined alternatives) registered.
- Provides an opportunity for expressing individual needs in accessing and using professional (specific to leather products industries) training services.
- Makes the survey anonym (if respondents do not want to give their coordinates) to guaranty openness and realism, at the same time makes it possible to distinguish training needs of different groups of companies (e.g. micro, SME, domestic supplier, export oriented, artisan, mechanized).

In order to remove at least part of these questionnaires' handicaps they should be in the native language of local industrialists, properly briefed data collectors should visit and assist selected responders in filling in the questionnaire. In any case the presented (sample) questionnaire might serve as *guideline*

Effective TNA would rely on a combination of several above mentioned data collection methods and approaches. Data/inputs may be collected from all relevant enterprises (it is quite possible in case of small industries or in clusters) or representatively (assuring that statistically justified sample is approached with proportional participation of operations of relevant profiles).

⁴⁰ Micro- and small-scale manufacturing companies are headed, controlled and represented predominantly by entrepreneurs (owners) and as such they are the only authentic responders, at the same time they normally have very limited time for other activities than controlling their companies, plants, operation.

PROFESSIONAL TRAINING WORLDWIDE

In order to build a new or to enhance existing training activities tuned specifically for the actual needs of local leather-based industries, review of good [manufacturing] practices (GMP) applied in history⁴¹ and/or presently in leading countries is the best starting point. **Learning by example**⁴² is one of the most effective ways of improving performance (as opposed to the also frequently used *trial and error* method requiring a lot of innovation, patience, time and sometimes luck that is unaffordable in case of professional education and training). This chapter offers a structured overview of professional training implemented worldwide, indicates best (in some cases past) practices that may serve as *benchmarks*.

Professional Education

Professional education systems (usually accredited, recognized or acknowledged by respective Government authorities) existed in the leather products industry had three clearly distinguished levels:

- Participants of *apprenticeship* or *vocational training* became skilled craftsmen (workers) having all necessary (manual) skills and basic knowledge (of materials, [hand]tools, technology variants, quality aspects etc.) for working independently and making the product. Originally leather and fur processing (tanning and finishing) were different professions. At early stages further distinctions were made within footwear manufacturing (in some – especially East and Central European – countries): boot making, (national) slipper making, custom (made-to-measure) and/or orthopedic shoemaking, shoe upper manufacturing⁴³ and shoe assembling (bottom making) were different professions. Other leather products making/manufacturing professions⁴⁴ thought in vocation training institutions were leather goods making (trunk/suitcase/luggage making was a separate profession about 50 years ago), glove making, fur coat and hat making (confectioning), saddler and harness (for horses and horse cars) and ball making. Practical exercises (skill development) took up 60-100% of the total time spent in these schools – either in the workshop of master(s) or those of the school. Pre-requisite for entering apprenticeship was usually the successful completion of elementary/basic school (4-8 grades); total duration of this education was 1-3 years.⁴⁵

⁴¹ The history of modern leather processing starts with introduction mechanized devices such as paddles and [rotating wooden] drums that replaced static pits. Modern shoemaking (and subsequently other leather products manufacturing) starts with the introduction of the first (sewing) machine by end of the 19th century. In reality introduction of organized professional education/training granting (legal) certificates on the acquired skills and knowledge that was required for working as craftsmen in the given technology/field approximately followed quickly the emergence of modern leather-based industries.

⁴² In business – as in other aspects of life we – learn and grow from the examples set by others. Imitation can lead to innovation. Finding good examples (GMP) is assisted by benchmarking.

⁴³ In this context “making” indicates manual (artisan-type), “manufacturing” refers to mechanized (factory-type).

⁴⁴ Genuine leather had been used for garment (jackets, motorcyclist suits, safety clothes) and furniture/upholstery industries as well; however the process technology basically remained as applied for textiles, so there was need for specific vocational training in these fields.

⁴⁵ Until early 19th century in many countries/places masters had the right to set the duration of apprenticeship and they decided when (at what acquired skill and knowledge level) the incumbent was released as craftsman.

- Secondary professional education was provided in technical *colleges* or similar *professional schools*.⁴⁶ The emphasis was on theoretical aspects of the given technology (e.g. tanning chemistry, design, pattern making, material knowledge, process technology, equipment, work organization, occupational safety and health – OSH), economics and management. Graduates received diplomas enabling them to undertake technical (e.g. technologist/technician, quality inspector) and middle-managerial (e.g. line or production supervisor) jobs, whereas this diploma was equivalent to Matura⁴⁷ or American-type high schools, i.e. qualified for entering polytechnics or universities. The share of practical work in the secondary professional educational process was 20-40%. Incumbents acquired less manual skills than workers (though with some exercises on the factory shop floor they could also be employed as skilled workers/key operators), but knew more of principles and technical features. Entry requirement was the successful completion of elementary/basic [plus supplementary (where existed)] education (6-10 grades); the duration of the school was 2-5 years.⁴⁸
- Higher professional education was organized in *polytechnics* and *technical universities*. Students with completed secondary education (10-12 grades or equivalent combination of general and professional basic and secondary schools) could be entered and spent 3-5 years before receiving (certified/diploma) engineer, BSc, BTech or MSc degrees. Skill development (in making/manufacturing workshops) is limited to 0-5% of the total tuition time, though the volume of laboratory works may be 30-60%. The character of this education is close to chemical or mechanical engineering.

In some countries (e.g. in the former Soviet Union, Czechoslovakia, German Democratic Republic) organized PhD-level education in leather processing and leather products manufacturing technology was also organized.

Diplomas or *degrees* issued by educational schools and institutions were and are recognized by the entire society (at least in the subject country) since they are resulted by successful completion of educational programmes fitting in the officially established education system and they are comparable with similar certificates issued by other institutions. Normally these systems are hierarchical and as such define exactly the grade of obtained skills and knowledge. These qualifications have also legal value as they empower their holders to enter higher education requiring the given level of education and enables incumbents to apply for certain jobs requiring the corresponding diplomas or certificates.

With the decline of leather and leather products manufacturing (i.e. due to less demand for skilled labour and specialists in this trade) in Nord America and Europe, starting already in late 1970s, as well as with rapid technology development (requiring more specific knowledge) the above structure of professional education gradually has disappeared. Former vocational training institutions, specialized colleges and university faculties either were merged with other areas (e.g. textile and garment under new title as “clothing engineering” or “fashion technology”) or simply closed down their operations. Specialized secondary schools are releasing educated technicians in

⁴⁶ In Germany, Switzerland, Central and East Europe such schools were named as “Hochfachschule” (= higher professional school) or “technikum” (= technical secondary school/college).

⁴⁷ Matura (Matur, Maturita, Maturità, Maturität, матура) is the word commonly used in Albania, Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Italy, Liechtenstein, Republic of Macedonia, Montenegro, Poland, Serbia, Serbia, Slovenia, Switzerland and Ukraine (obsolete in Ukrainian language) for the final exams young adults (aged 18 or 19) take at the end of their secondary education.

⁴⁸ Some national educational systems provided alternative access to secondary professional education insofar that those having already completed general secondary schools (e.g. had Matura from a “[Bundes]Gimnasium”) could complete technical secondary schools in half the normal duration.

the Czech Republic, Hungary, Romania, Germany and UK. Degrees in leather products manufacturing technology are still could be obtained in Germany (Reutlingen, Kaiserslautern), Russia (Moscow, Sankt Petersburg) and Ukraine (Kiev). At the same time similar professional education systems and/or facilities have not been established in developing countries that produce nowadays the majority of leather products and exporting them to the globalized World market. The only exemption is Brazil where the Government controlled (and financed) SERVIÇO NACIONAL DE APRENDIZAGEM INDUSTRIAL (SENAI) network is operating all three levels of professional education related to leather-based industries. In Vietnam a similar system is being set up. India traditionally had strong education and R&D regarding raw hides and skins, leather processing and finishing; more than a decade ago started to develop an intellectual structure⁴⁹ for tannery pollution control and leather products manufacturing, which is making a visible impact on the industry performance.

Professional Training

Decades ago skills and knowledge obtained during the professional education process (at any level) was profound enough and lasted throughout the specialist (craftsman, technician, engineer etc.) life. With diversification of the production (e.g. component pre-manufacturing) and with technical development (introduction of new materials, mechanization, CAD/CAM/CIM techniques) the basic and general knowledge had to be upgraded, supplemented or new skills (e.g. setting automated equipment) had to be developed. More and more specialists graduated in other industries (e.g. chemistry, electronics) or in general sciences (e.g. applied design, economic, business administration) entered the leather products trade: they needed short but specialized (re)training in this technology that could be organized through appropriately tailored courses. Such training was and is provided within (larger) companies, at institutions specialized on the certain subject (e.g. design studios run pattern engineering, standard bureaus offer quality assurance courses).

Training had also been used in enabling uneducated (in the field of the assigned or targeted job) entrants and for developing skills and/or knowledge of previously educated employees. The distinguishing feature of these types of training was and is their short duration ranging from couple of hours (e.g. work safety) to several weeks (e.g. use of new computerized production management software). Another characteristic of training is that it is provided to people to be employed in jobs requiring competences developed by the given training (course), whereas education covers much wider knowledge base. Training is also more practical applications oriented, while education concentrates on principles that would assist incumbents in adapting their knowledge in different actual conditions.

Earlier certain *certificates*, *diplomas* or *licenses* (e.g. master title for starting private operation, time-study engineer, work safety inspector) could be obtained only through attending special courses and/or passing successfully the respective examinations. Corresponding jobs could not be performed by persons lacking the required certificate even if the incumbent had the highest (university) degree. However, such training courses were mostly run by professional education schools after having obtained respective accreditation.

⁴⁹ UNIDO provided extensive technical assistance through its regional South-East Asia tannery pollution, as well as through the (UNDP funded) National Leather Development Programme (NLDP).

Scope of Professional Training

Jobs and tasks (to be) carried out by employees of leather products manufacturing plants may be structured by the required nature and level of skills and/or knowledge. A simplified structure of areas, levels and corresponding typical *technical* jobs/tasks are illustrated in **Figure 3** that shows characteristic career development within the *technical* field paths as well.

Level	Physical workers	Management			Marketing	Administration
		Production	Product development	Quality assurance		
Low	Unskilled	Foreman			Agent	
Medium	Semi-skilled	Supervisor, technologist	Pattern engineer	Inspector, laboratory staff	Shop staff	Costing, store staff
High	Skilled	Manager	Designer	Coordinator	Distributor	

Figure 3

Simplified structure of technical jobs/task in leather and leather products manufacturing

In production environment the main distinction is between

- physical workers** (frequently referred as *direct labour*) interacting directly with products, materials and production tools (such as equipment, premises and utilities) and
- management** dealing with intellectual activities preparing, organizing and realizing the production process.

Besides natural professional/technical differences (e.g. tanning, footwear, leather goods, machine maintenance) **physical jobs** require different competency levels characterized by the amount of (mostly manual) skills involved. In this context factories and workshops employ

- unskilled* workers performing jobs that need no specific skills, i.e. that every person would have anyway (e.g. cleaning, transporting);
- semi-skilled* workers normally acquiring movements and necessary knowledge on the job (through training or by doing), are capable to carry out simple operations, need thorough supervision and quality control (check);
- skilled* workers having profound knowledge of the technology and reasonably developed skills for performing key (sophisticated) operations, usually educated in the vocational training facilities.

Technical (production and marketing) **management** positions directly related to materials and products are more structured but all of them need specific knowledge of technology. Therefore, in ideal conditions these tasks are performed by appropriately *educated* (in this technology) personnel. However, highly experienced skilled labour may develop to the level required for some of such managerial jobs – especially in the production control area (e.g. foreman).

Professional training (as defined in the Terminology chapter) addresses following skill and knowledge development needs:

- basic*: for unskilled and semiskilled physical workers (mostly newcomers);
- progressive*: enhancing existing skills and competencies to the requirements of the (next) higher level job/position (e.g. from skilled worker to foreman/line supervisor);

- *introductory*: when new technology (e.g. materials, machines, computer programs) and/or methods (e.g. rink systems) are introduced;
- *specific*: enabling to deal with special tasks not performed in the previous position (e.g. quality inspection, laboratory testing).

Training Systems

Jobs and responsibilities to be assumed by employees in (leather-based) manufacturing industries are becoming more and more complex, at the same time they are getting more specialized. Just 3-4 decades ago tanneries, shoe and leather goods factories employed mainly labour and staff educated (graduated) or trained in these technologies or their composite parts (e.g. shoe upper sewing, flat leather goods making). As the leather products manufacturing became an assembling industry procuring essential components (e.g. uppers, stiffeners, insoles, unit soles and heels for shoes or wooden frames for diplomat cases) from outside suppliers, as the range of materials and equipment became wider, as the entire business' complexity grew, the composition of employees with regards their skills and knowledge had to be diversified. The natural consequence is that the share of specialists educated in other areas/subjects (e.g. chemistry, pollution control, logistics) had to be employed and (re)trained in – at least in some aspects of – leather products.

Technology development subdivided the technological process into operations that can be performed by specifically designed machines (e.g. splitting, edge binding, riveting, pulling over and lasting, sole press). Workers no longer make leather, complete shoes, handbags, gloves etc.; instead they perform one or a few operations requiring much limited skills and knowledge. These specific operation and tasks can be learned within a few hours or maximum couple of days: the only exceptions are genuine leather cutting and (shoe upper, leather goods, gloves, leather garment) sewing requiring several weeks (up to 3 months) training.

(Centralized) institutions⁵⁰ in traditional leather products manufacturing (industrialized) countries, large (multinational) companies and brands used to have; large institutes⁵¹ and some advanced companies in developing countries have today sophisticated and more or less complete training systems – normally built on or closely associated with the national professional education structure. These have the following features:

- ❖ *complementary*: supplying knowledge not obtained during professional education;
- ❖ *targeted* focusing on selected and usually very practical subjects;
- ❖ *flexible*, i.e. applicable according to actual needs and adjustable to the qualification of trainees;
- ❖ *modular*: composite parts of the required knowledge base were concentrated in courses from which fairly comprehensive competences could be developed over a period of time without taking away trainees for too long period from their duties;⁵²

⁵⁰ These institutions were controlled by Governments (e.g. as part of professional educational facilities or specific organizations) or by (non-profit) trade associations or by foundations or by business-oriented institutes or by [larger] companies.

⁵¹ E.g. CIATEC in León/Mexico, CLRI and FDDI in India, SENA in Colombia, SENAI in Brazil.

⁵² Modular training systems are frequently associated with corresponding *credit* systems. The latter assigns numeric or quantitative parameters to modules, so complex modules can be thought only to those having collected sufficient credits (points) by absolving basic modules. Qualification or different (level) degrees or certificates are granted to those collected required credits. These combined systems may also define some modules as obligatory, others as alternatives or facultative.

- ❖ sometimes or in some parts *hierarchical*, i.e. courses are build on each other, so certain qualifications and certificates could be achieved what would otherwise need traditional professional education.

Building up a professional training system takes a lot of efforts, initiatives, fairly long time (years) and continuous upgrading – in fact it is an endless activity.

Types of Training (Contents)

Training opportunities are normally offered in form of courses and/or lessons. Actual skills to be developed and/or knowledge to be generated or passed are normally tailor-made to the defined course objective. The substance (subject) serves the set purpose and as such should be in line with set requirements (e.g. enabling incumbents to operate a machine, understanding behavior of new materials when processed), should fit (e.g. intellectual and experience) capability level of trainees (group) and should ensure that the targeted skills or knowledge will be acquired by trainees by end of the training (course).

The range of substances (subjects) of training implemented in leather products manufacturing industries is extremely wide and constantly changing. Some courses may be ad-hoc to assist in solving actual and perhaps one-time problems (packaging products for a specific client imposing specific requirements – aid supply to regions suffered from natural disasters or war), but the majority are typical, many of them are addressing recurrent needs (e.g. induction training for newcomers). The following list provides an overview of the most frequently met training activities, but it is far from being exhaustive or complete.

- **Induction:** introductory or appreciation training providing insight, i.e. basic and/or general information, demonstrating features and/or providing opportunities for trying some aspects or parts of the subject area. Characteristic example is the training given to new employees of companies or very basic shoemaking courses run for retailers and non-footwear specialists (e.g. buyers, component manufacturers, machine suppliers).
- **Operator training:** skill development of physical workers performing specific operations, operating specific machines, undertaking certain processes. This is typical for enabling unskilled workers to do simple jobs (e.g. assisting cutters in collecting cut pieces, cleaning shoe uppers in finishing) and train semi-skilled labour (e.g. applying adhesives, skiving, fixing interlinings). Content is very specific as it is related to the purpose and actual conditions (operation, machine etc.) of the given training.
- **Instructor training** (known also as “*training of trainers*”): desirably educated specialists (skilled workers having reasonable working experience and highly developed skills) are trained to induction methodology⁵³ that can effectively be applied in organized training of prospective unskilled and semi-skilled operators.
- **Certificate:** courses providing knowledge and sometimes examinations after completion of which a legally valued (prescribed, demanded, accepted, appreciated) a certificate is granted. Only those having the required certificate (from the authorized organization) may

⁵³ In efficient industrial plants newcomers having neither previous education nor experience in the given technology (“green labour”) are undergoing organized training in the target (group of) operations conducted by properly prepared instructors. This is to replace the old – but still widely used – approach when new workers are spending hours or days or weeks with exercising the subject job under – usually remote – control of the line or workshop supervisor (kind of self-training) or placed next to a skilled/experiences operator and expected that appropriate working methods would be learned by seeing (in UK this is named “next-to-Nelly” method).

be employed in certain jobs (e.g. maintenance of branded equipment) or can perform certain duties (e.g. safety inspection) or authorized to issue certain (e.g. quality, custom) certificates.

- **Technical:** most of the training opportunities (especially courses) have one particular subject (e.g. adhesives, quality, marketing) or a well-defined process or duty (e.g. design, shoe upper sewing, finishing, production control). As opposed to introductory or awareness raising technical training concentrates on technology-related issues.
- **Informative:** when new opportunities (in terms of materials, equipment or computer programs, services etc.) are publicized – basically for raising or widening awareness of their availability.
- **Upgrading or retraining:** imparting knowledge required by (technical) development that has taken place since incumbents obtained their skills or when new technology (procedure) is adapted.

Of course, actual training (opportunities, courses) may be – in the majority of cases are – combinations of several types mentioned above.

Annex 2 compiles training opportunities and courses implemented in and/or available for the leather-based industry Worldwide.⁵⁴

Organization of Training

Training Providers

Training is a (support) *service*, at the same time it may also a *business*. Training may be **provided** by

- Government authorities (e.g. health, environment, foreign trade);
- trade associations⁵⁵ – especially when the training material (content) is available within the given (sub)sector;
- (professional) educational entities (schools, colleges, universities, academies etc.);
- specialized institutions dealing with only this activity;
- institutes and organizations generating knowledge (e.g. R&D);
- suppliers of goods, information and or services (e.g. finishing chemicals, CAD programs, agents);
- private/free-lance experts (e.g. international consultants, legal advisors);
- internal units, i.e. part of the recipient company or organization (e.g. HRD department, training unit, sales unit).

Sometimes training providers need to obtain accreditation (from authorized organizations or from the source of knowledge) that guarantees adequacy and quality of their services. Such accreditation may be given to the provider (organization) or to specific courses.

Economic surveys conducted in several countries and practice proved that *institutions dealing with (professional) training cannot be financially self-sufficient*, i.e. training costs cannot be recovered from fees only. Therefore either (local) Government or other non-

⁵⁴ The table in *Annex 2* lists mainly courses offered by various institutes around the globe in the period of 2006-1009. However, it is not exhaustive, but offer a good overview of the range and topics covered.

⁵⁵ Professional trade associations are understood within this document as non-profit, non-governmental (NGO) or civil society organizations (CSO). They are expressing interests of manufacturers (entrepreneurs and employers) interests operating in a given sector. Trade associations are completely different from trade unions: the latter represent employees' interest.

governmental (NGO) or civil society organizations (CSO) – especially trade associations⁵⁶ – provide financial support. Other types of institutions (e.g. R&D, export promotion services) may solve this problem by cross-financing (part of) training from other activities.

Forms of Training

The overwhelming majority of professional training done in the leather products industry is in the form of targeted *courses* (see *Annex 2*), but the fast development in ICT electronic learning is becoming more and more popular. However, development of didactic methods that would take advantage of the rapid spread of ICT tools capable of handling very complicated knowledge base, as well as transferring of accumulated knowledge to new media is lagging behind (even in general sciences like mathematics, physics etc.) so these forms of learning are penetrating leather and leather products training is fairly slow.

When courses are introduced, promoted or when training opportunities are offered (to public, companies or employees) the following information is ought to be provided:

- title or subject,
- short description of the substance/content,
- level,
- in case of modules: link with other modules and credit value
- entry requirements,
- training method (e.g. lecture, share of theory and practice),
- examination and certification,
- duration,
- timing (full or part time, starting date and time),
- place/location,
- group size (minimum or maximum number of participants);
- costs (fee, exams, certificate, materials, others),
- financial support (if available).

By and large the above constitute the external information base required in designing training courses (internal factors are technical and directly related to the subject and professional or specific content).

Timing

This is considered as the most difficult problem in the leather-based industry (especially in industrialized countries) – more that associated direct costs (participation/attendance fee, examination fee, travel, materials etc.). High-tech industries and large (multinational, branded) companies regard knowledge and skill development as effective (if not even more efficient) investments as purchasing new machines.

- Traditional vocational training has been replaced by efficient and concentrated skill development for genuine leather cutters and (shoe upper) sewing machinist. Green labour is trained in groups of 6-8 trainees⁵⁷ under instructor guidance for 8-12 weeks (320-480 h). Retraining of sewing operators is required 2-3 times after basic skill development: this takes 2-5 days each time. Other *semi-skilled* operations are trained in 3-5 days (20-35 h) within the plant.

⁵⁶ Trade associations may generate required funds from the income generated by trade fairs (as organizers, coordinators or facilitators) or from their other services.

⁵⁷ Normally in special training workshops within the company or at the nearest training centre.

- Line/plant *supervisors* are trained (from skilled or highly experienced operators) by providing them with technology concept knowledge (80-300 h) and managerial (additional 150-250 h) part time or evening training.
- *Designers* and *pattern makers* (normally having either working experience in shoe or leather goods industry or education in [applied] art) spend minimum 200 h training in footwear and 120 h in leather goods. As a rule this is done in specialized (fashion-oriented) institutions.
- *CAD techniques* are trained by suppliers of CAD systems/programs (as part of the delivery. However, initially trained (usually 2-4 CAD operators, designers or pattern engineers)⁵⁸ may leave or be promoted within the company, so there is need for training other people as well.
- Introductory and *technical training* (mostly for staff) may last between 1 to 20 days (7-140 h) depending the subject and level (perfection).

In advanced leather products manufacturing some specialists undergo short training periodically, e.g.

- *environmental specialists* should attend refreshment training courses dealing with new aspects of environmental protection (these should not necessary be specialized in tannery pollution control) at least biannually (1-5 days);
- *leather technologists* should receive retraining in use of new chemicals and cleaner production on an ad-hoc basis (4-20 hours);
- *designers*: actual fashion trends and brief (before new seasons 1-3 days);
- *sales and marketing*: distribution strategy and instructions (before new seasons 1-2 days);
- *technologists, plant supervisors, quality inspectors* (every 1-3 years, 1-2 weeks).

Short term (7-20 h) and intensive training is normally full-time, i.e. from morning 5-7 h/day and in one go. Similarly skill development is best done full time, but retraining (e.g. sewing machinists) may be organized in evenings (3-4 h/day, 2-3 days/week) or weekends (7-16 h/weekend).

Location/Premises

Large companies and specialized training institutes have well-equipped training workshops (for practical/skill development), though machines here may not be of the latest models. The most important features of these plants are that they have equipment and materials for the group of trainees, maintenance service is readily available and these capacities are never used for production purposes. Theoretical training is implemented in properly equipped (computer, [W]LAN, Internet connection, projector, screen, whiteboard) meeting, conference or classrooms. Premises for theoretical training either arranged and kept for this purpose in larger companies, training organizations and many trade associations⁵⁹, or appropriate places may be rented (e.g. in schools, universities, cultural centres).

Both practical and theoretical training facilities should provide appropriate (comfortable) ergonomic conditions (space, cleanness, lighting, furniture etc.). In fact training rooms and workshops themselves perform educational functions insofar they serve as a good example (GMP) to trainees/participants and by that they influence the behavior of the latter in their prospective jobs.

⁵⁸ A common mistake seen (especially in developing countries) is employing (and [re]training) computer specialists to shoe or leather goods design and/or pattern making. However, computer sciences and design need completely different abilities and skills, but designers can learn operation CAD programs easily, while computer engineers or programmers will hardly acquire necessary drawing dexterity, aesthetic and harmony appreciation, taste.

⁵⁹ Meeting rooms are also used for training.

Certificates and Examinations

Some training is made and used for obtaining respective *certificates*⁶⁰ that are pre-requisites for performing certain jobs or occupying certain positions. In these cases examinations are organized and certificating documents are issued by independent (from the sector and its organizations) and accredited (empowered) authorities. Acceptance of such certificates are regulated by regulations (e.g. legislation) or by organizations (e.g. in the area of work safety, environment) or by the employing entity (e.g. in contracts, internal instructions).

In practice participants of training may or may not receive some kind of acknowledgment or proof on their involvement in the subject event. Certificates are proofing

- attendance: the participant appeared or was present continuously or at the end of the course;
- completion: the participant was continuously present and/or proved that he/she learned the subject (i.e. his/her feedback was satisfactory or his/her acquired knowledge or skill was somehow ascertained);
- acquired knowledge/skill (as such or graded) – this may also be in cases when incumbents did not participate in training, just passed the necessary examination.

Examinations or final tests may be arranged by the same organization that implemented the training or by independent entities (committees, authorities).

The **value of training** and its certificate (if issued) depends basically on the appreciation of it by (prospective) employers and the (micro)society. In case of jobs/occupations requiring respective certificates the reward is straightforward as in the absence of the proofing document nobody should be employed. In all other cases the actual value is measured in practice: if the acquired knowledge and/or skill produces or contributes to success (getting jobs, performing easier or better than before etc.) or generate value added (e.g. better quality, higher productivity, increased sale), than both incumbents, colleagues and the employing organization recognize and honor it. Such rewards may be moral or material (financial), but in any event rewards are the real *motivation* for participating in (by employees) or providing, encouraging, forcing (by employers) training. Subsequently motivation is the prime driving force for training and one – beside methods and conditions –of the important factors for ensuring training efficiency and effectiveness. All these make some training opportunities or courses highly appreciated and, therefore, demanded that makes the subject training appealing, sellable and bring it close to (financially) self-sustainable.

Financial Aspects

Education and training cost time and efforts, uses human, material, energy and/or financial resources: training does not exist without costs. Enabling professional *education* offered to unemployed people or to those having no qualification (e.g. young people completing and/or leaving general education and looking for [specific] jobs) may be financed or supported by Government authorities (e.g. municipalities). Re-educating for new qualifications when certain working opportunities are discontinued (e.g. by closing plants) in the region may also be supported by public entities – unless new jobs are created by private companies (e.g. by starting up new, enhancing existing production facilities).

Training costs may be covered by

- the entire society (through Government subsidies, from a specific levy, by foundations, stipends, trade associations etc.),
- employers (companies, institutes, organizations),

⁶⁰ Diplomas normally are issued for those completing successfully some form of (professional) education; certificates may be granted to participants of training courses or those passing examinations or tests. However, there is no exact rule or definite practice in this respect: issued or granted documents may have different titles/denominations.

- participants (trainees) or
- sponsors (e.g. suppliers, cooperating partners).

In practice a combination of the above sources is the most frequently used form of financing.

Beside training fees *other costs* such as materials, hand tools, travel, lodging, food etc. may also occur. Covering these expenses is subject to the agreement made by employers and employees (in companies), the training provider and the trainee, the sponsor (if available or involved) and beneficiary – in general: among all parties concerned.

No training should be entirely free⁶¹ for participants, otherwise it appears to be valueless generates limited motivation. In case of free training trainees do not devote sufficiently their personal resources such as attention, intellect, skills etc., that will certainly have a negative impact on the efficiency of training. Internal training (within companies) or those initiated by the employer (e.g. skill development, instructors, CAD/CAM) are normally financed by the enterprise, but even in these cases may be some arrangements or agreements regarding payments between the two parties. Upgrading, technical training initiated by people (whether employed or not) are usually paid by incumbents themselves. Government, organizations, associations may offer stipends, banks and companies may advance education or training fees that should later be reimbursed (interest rates are usually much lower than commercial rates or may not be applicable at all).

Those supporting or contributing to training costs may enter into *legal agreement* with the recipients, target or direct beneficiaries (e.g. sponsors or Governments with associations, companies or participants) in which certain criteria or requirements are set for granting the set assistance. One of the typical trainees' obligations is that they remain with the company for a given period of time, otherwise they have to repay part or all of [training and other associated] costs involved.

⁶¹ Trainees' contribution may be in form of time (e.g. evenings, weekends, part of annual leave), finance (fee), material and/or (hand)tools or in any other ways that required for the implementation of the subject training.

DEVELOPMENT TRENDS IN LEATHER-BASED INDUSTRY PROFESSIONAL EDUCATION AND TRAINING

This chapter offers information on selected actual steps being made by various organizations in developing for or adjusting available professional educational and/or training systems, contents and methods to actual and (assumed) future needs of the leather processing and leather products industries.

Responsibilities

Establishing and operating (including financing – fully or partially) professional educational and training facilities has been regarded as the responsibility of (central or local) governments. Centrally planned economies treated all kind of education as public goods provided to their citizens virtually free of charge. This is still the common perception in developing countries. Market oriented economies regard industry as a business producing profit, so it is expected that companies as private ventures cater for their needs in skilled labour and cover immediate costs of related training.

Generating and maintaining jobs are in the interest of the entire society (of countries, regions), so public funds and even (human and physical) infrastructure are offered or provided by governments – especially in case of setting up manufacturing plants in areas suffering from severe unemployment or when certain industrial activities (e.g. preferred sectors, increasing value added on locally available raw or basic materials) are key components of national economic plans. *Professional education* is a long term investment that may not be appealing to entrepreneurs, especially in rapidly changing economic conditions. One of the most widely used tool for involving industrialists in raising new generation of professionals (in fact their own successors) harnessed with up-to-date knowledge is the collection of a levy. That constitutes a fund from which costs of the professional education can be covered.

Trade associations have a prominent role in conveying quantitative and substantive needs of the industry to governors of professional education. Furthermore, industry (employers') representatives should also be involved in guiding and supervising professional training institutions. In practice associations should be intermediates between training providers (institutes) and ultimate recipients (manufacturing plants) by communicating needs and orienting freshly released specialists within their industrial (sub)sectors. Quite often trade associations organize and implement professional training activities (e.g. courses) within their premises or in selected industrial plants. In this domain the majority of related costs should be covered by recipients (the association, companies directly involved and/or incumbent persons). Nevertheless, even in such cases arrangements or agreements may be concluded with public entities regarding cost-sharing. There are no recipes: it is up to the society (governments) and the industry (association) to find the appropriate balance of responsibilities together with related rights.

Usually *R&D institutes*, as well as material and production machinery *suppliers* offer training opportunities. Their motivation is to share their knowledge and achievements, at the same time

to promote their products and services. CAD/CAM, special material suppliers may include respective training in their prices or may be set training as a condition for selling their products.

Annex 3 lists⁶² professional associations, R&D, fashions and technical institutions, as well as international organizations associated with leather and its derived products design, technology and manufacturing.

Dispute between the Education and Industry

Industry representatives (employers, managers, associations) are more often than not unsatisfied with the actual knowledge and skill level of newcomers released by professional educational organizations. The usual complaints are the obsolete equipment at training workshops, inexperienced (in production) teaching staff, static knowledge base reflected in training materials and low productivity (virtually insufficient skills, slow performance, lack of practicalities of the given enterprise or plant) of people released. While normally such judgments are valid, the disputed gap between education and the instantaneous needs of manufacturing cannot be eliminated entirely for the following reasons:

- Financial resources of and space available at professional educational institutions are limited and do not provide room for frequent changing of their machines.
- Teachers and instructors need and have different knowledge and skills for that required in a particular plant, since they should concentrate on teaching and apply appropriate induction (technology) rather than developing speed and stamina of trainees.
- Recipient industrial units cannot afford to admit (large number of) students/trainees to their own facilities without hindering the production flow and quality of products. Neither can they share their own production and/or managerial staff that would not have the knowledge required for teaching.
- Institutions concentrate on principles, develop background knowledge and demonstrate a variety of technological options in order to prepare students to cope with a wide range of technical problems – including those that do not exist in practice at the given moment. In other words efficient education should lay a strong foundation for lifelong learning.

There are GMPs for finding mutually satisfactory (but not perfect) solution(s) to this dilemma that are based on close cooperation of the two parties concerned. In many (larger) companies new specialists coming directly from education undergo series of special (additional, refining) training courses or well planned practical exercises, so within the shortest possible time they can be fully active and operational employees contribution (in the assigned posts) to the goals of the company.

⁶² Although tables in *Annex 3.1-3.5* provide quite comprehensive lists of organizations, they should not be considered complete or exhaustive. In reality for various reasons some (especially smaller) associations or institutions may not be “visible”. At the same time as the World economy and industry structure are changing, such institutions are being established, merged or separated, closed or transferred, change their names etc., so their database needs constant updating.

Problems with the Traditional and Present Practice

The introductory chapter of this paper has already indicated some of the reasons why completely new approaches should be sought and implemented when developing new generation of professionals for tanneries and leather products manufacturing or training (semi)skilled workers for particular operations. A great deal of the following problem areas has been recognized over the past decades, but no concentrated efforts or convincing solutions have emerged so far.

Geographic unbalance

Equipped and staffed facilities for professional education and training exists (and mostly under-utilized) in industrialized (chiefly European) countries, whereas the majority of leather and leather products is manufactured in developing countries without having appropriate training facilities. Several institutes had tried hard to mobilize their existing resources for the benefit for emerging producers (in South-East Asia) by enrolling students/trainees from overseas, but actual results are just drops in the sea. The small groups at LEICESTER POLYTECHNICS, NORTH-AMPTON COLLEGE, schools in Reutlingen, Pirmasens (Germany) and at the International SCHOOL FOR MODERN SHOEMAKING (ISMS) in Zlin (Czech Republic) are partially recruited from foreign countries (in case of ISMS mainly from Vietnam). The CENTRAL LEATHER RESEARCH INSTITUTE (CLRI) in Chennai, the FOOTWEAR DESIGN AND DEVELOPMENT INSTITUTE (FDDI) in Noida, the CENTRAL FOOTWEAR TRAINING INSTITUTES in Agra and Chennai (all in India) are good examples⁶³ of training providers catering for not only local tanneries, footwear and leather goods manufacturers, but also educating people from Bangladesh, Myanmar, Sri Lanka etc.

Requirements in knowledge and skills

Technology and enterprise (production management) development gradually broke down the manufacturing process into operations that could be mechanized and would require different [level of] skills (dexterity, attention, background knowledge etc.). As such workers could be trained to perform operations easier and faster than to the entire process, yet due to relative simplicity, acquired routine because of repetitions/frequency and specialized equipments (tools and machines) the overall time spent on the entire process of making the [final] product was reduced, i.e. the manufacturing productivity increased – in spite of additional time required for handling (taking up and putting down, feeding and releasing) work pieces and moving them between operations. Automation merges again some of the (adjacent) operations, removes related surplus movements⁶⁴ and takes care of various intellectual aspects of the job (e.g. optimizing, measuring, controlling, guiding). The result for today is that highly skilled labour experienced in the entire production technology (i.e. capable of making the product) are required only in specific cases (e.g. made-to-measure and orthopedic footwear, sample making), which represent only a very small (less than 1-2%) share of the total production. The practical appearance of this have been and is being seen around the World when new manufacturing plants are established in areas having traditions and abundant highly skilled and experienced (manual) labour, but entrepreneurs and managers of the new and well equipped capacity refrain to employ any of skilled workers, instead they recruit unskilled (in the subject technology) people and train them

⁶³ All these institutes are products of earlier UNIDO technical assistance projects implemented under NLDP.

⁶⁴ It is rather interesting that while automats tend to take over even quite sophisticated segments of the human work (e.g. nesting of patterns and optimizing their layout in automated genuine leather cutting), most boring parts of the operations requiring no skills (and, therefore, training) at all (e.g. separating patterns from wastes) and remain to be performed by operators servicing the equipment.

for specific operations.⁶⁵ The success of employing unskilled physical workers is clearly demonstrated in South East Asia where thousands of new large-scale operations employ millions of people having no knowledge of leather products making or manufacturing at all, yet producing acceptable quality products for demanding markets (such as Europe, Japan, USA) of the World. Moreover, new massive clusters in China (Haining, Guangzhou, Wenzhou, Fujian, Sichuan, Xinjin etc.), Indonesia⁶⁶ (Bandung, Jakarta, Surabaya, Yogyakarta), Thailand and Vietnam⁶⁷ where no professional educational or training facilities are available and no visible plans are on the horizon for establishing such facilities.

Objectives

Well established professional *educational* institutes specialized on and/or targeting leather processing and leather products industries still follow traditional “trinity” qualification ranking, i.e. apprenticeship, college, higher education. Professional areas or specializations normally include functions (e.g. designer, technologist, environmentalist) and/or productions (e.g. leather processing, footwear, leather goods).⁶⁸ Of course, professional *training* is much more specialized, though certain classification of activities may also be done here: e.g. [semi]skilled labour, agents, special operations, new products. As a rule *retraining* is concerned with increasing qualification, i.e. employees already having certain knowledge, experience or profession are undergo additional or specified upgrading or extending training. The most characteristic examples of such retraining is applied for specific or sophisticated machine operators, toolmakers, maintenance technicians, instructors, for introduction of CAD systems, quality inspectors, [line and plant] supervisors, managers of different sections/departments or administration etc. However, this approach is now fairly inadequate as high and medium level technical and managerial staff of tanneries and leather products manufacturing companies are more and more recruited with qualification [or experience] gained in other areas such as [bio]chemistry, ecology or environmental protection, artists or industrial designers, orthopedists, physics, [chemical, mechanical, electric, informatics/ICT, logistics, quality, industrial] engineering⁶⁹, economics and finances, textile or garment technology. It should be noted that in today’s footwear and other leather products manufacturing only pattern engineering and genuine leather cutting are jobs requiring specific knowledge and skills – all other technological operations, functions and activities (of all level) may be done by newcomers or professionals (of other subjects) after appropriate training. This is probably what should be in focus of the future professional training in the leather-based industry, whereas stronger linkage to and cooperation with educational and training providers of general nature and other professions need to be forged.

⁶⁵ The rationale behind this practice is the following: unskilled and inexperienced labour is open for acquiring new technological approaches, their attitude in unbiased by habits or customs and – what is equally or perhaps even more important for entrepreneurs – may be paid at lower level.

⁶⁶ There is design education service rendered by the ACADEMY OF LEATHER TECHNOLOGY (ALT) established schools and the INSTITUTE FOR RESEARCH AND DEVELOPMENT OF LEATHER AND ALLIED INDUSTRY (IRDLAI – established and assisted by UNIDO), but these are far from being sufficient for the large local leather-based industry.

⁶⁷ The Government and the VIETNAM LEATHER AND FOOTWEAR ASSOCIATION (LEFASO) have serious plans for establishing and enhancing professional education and training but they face the usual problems of financial constraints and lack of expertise.

⁶⁸ The real overall is more complicated. Leather garment and fur confectioning specialists normally come from [textile] garment technical institutes. In many schools glove, upholstery and some sports goods (box gloves, balls), harness and saddles are either part of leather goods or all of them – together with footwear – are taught under the title of leather products or have no formal educational services at all.

⁶⁹ There are good examples of qualified and experienced architects achieving appreciable success as leather products designers (sometimes being owners and/or general managers of SMEs) of footwear or leather goods.

Duration

The globalization, the ever changing economic environment, specialization of demand for leather products, the accelerating influence of fashion and the rapidly developing technology together with prevailing short term objectives dominating policies of manufacturing enterprises do not tolerate any more extensive and lengthy specialized professional education. People interests (largely affected by the media and communication), as well as the appreciation and gradual adaptation of the lifelong learning principle also calls for more efficient, more target oriented, challenging and thus far shorter education and training implemented in the leather-based industry. In other words the range, orientation and especially productivity of imparting knowledge and training in the leather-related trade should catch up with the overall productivity of manufacturing.

Methodology

Conventional methods such as lessons in classrooms, demonstration of working methods and instructions on operating productive equipment are lagging behind human (new employees being young people having enjoyed and being surrounded in their private life with modern communication using a wide variety of impression effects) and economy (enterprises) expectations. Presently used teaching techniques and training materials are fairly boring, difficult to handle, very static and inefficient in conveying them to trainees (employees). ICT is offering a wide range of opportunities (e.g. internet) and versatile tools that can make knowledge transfer and skill development fairly appealing and effective. This is high time to learn from other sciences and manufacturing activities and to introduce up-to-date methodology in this sector as well.

Communication

While people appreciate materials of natural origin (including genuine leather and fur), the image of the leather-based industry is handicapped by several generally accepted perceptions such as

- raising and killing animals just for their hides and skins;⁷⁰
- heavily polluting the environment (air and water);
- being labour intensive and primitive operation;
- employing children and exploiting employees in developing countries.

Though it is not the subject of the present paper, the inappropriate interpretation of leather processing and leather products manufacturing has a serious effect on the interest of people in becoming associated with, let alone getting involved in this industry. Far better and more efficient publicity strategy should be implemented in the future to regain⁷¹ appreciation of public.

⁷⁰ Reference is made to greens' drastic actions against selling and wearing natural fur coats (made of mink, chinchilla, rabbits etc.); customs restrictions in many European countries with regards importing shoes and leather goods made of snakes, crocodile, lizards etc.; utilizing kangaroo hides for sports shoes; the recent apprehension of cattle raising in the Amazonas area.

⁷¹ Tanners were recognized in ancient ages (in Egypt because of producing shields from elephant hides for the army, in the Roman society – as it is proved by excavations e.g. in Pompei). Glove makers enjoyed prestige in France – especially under Luis XIV and later. Italian and Spanish shoemakers have been proud of their professions and appreciated by other citizens until very recently, just like employees of BATA, CHARLES JOURDAN, CLARKS, DERMATA, GUCCI, SALAMANDER, SAMSONITE (just to quite a few) worldwide, not to mention ADIDAS and PUMA in the 1950s, 1960s and 1970s.

Initiatives

1. Serious efforts have been made by R&D and educational institutes for summarizing knowledge accumulated for training specialists in this trade and to adjust them to actual needs of the industry. One of such attempt was supported by EU (project) nearly two decades ago, when details of leather making at operative's level were compiled under the management of the BRITISH SCHOOL OF LEATHER MANUFACTURE. The main objective was to provide respective knowledge in a form that would suit distance learning (primarily within Europe). Later these papers were re-edited into modules by the BRITISH LEATHER CENTRE (BLC) and they are used today by the BRITISH SCHOOL OF LEATHER TECHNOLOGY within the UNIVERSITY OF NORTHAMPTON. An introduction to leather manufacture⁷² was published as a series of individual articles in World Leather commencing 2002. These articles comprised 12 pages (A4 size) of compact text supported by a series of images, charts and panels that provide a clear and precise introduction to leather manufacture. These papers were created to stand the test of time. The complete set was then collected in the book entitled **“Back to Basics: Leather Manufacture”**: it suited education within Europe and the wider international industry. It was followed by the other book **“Back to Basics: The Environment”** including references to around 180 papers published on environmental matters that are pertinent to the leather processing sector. Finally 16-essays were created under the heading of **“Back to Basics: A Framework for Leather Manufacture”**.⁷³ All these books were translated into English, Chinese, German, French, Italian and Spanish. Contents of these books have been reissued in a series of two-page stand-alone essays in periodical World Leather. The publication entitled **“The machines in the tannery (a review of leather producing machinery and equipment in current use)”**⁷⁴ completed the compactly presented knowledge base of leather manufacture (*Figure 4*).

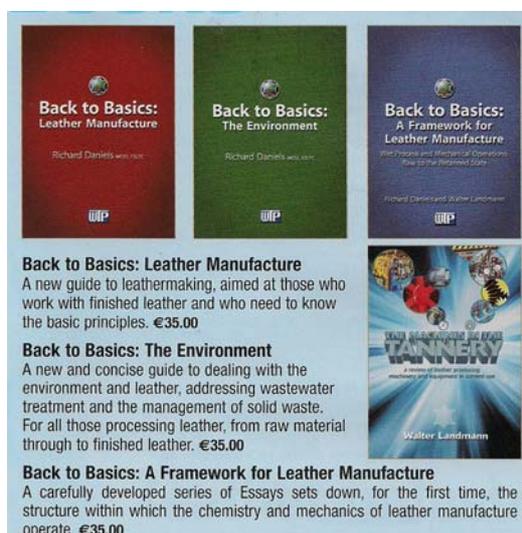


Figure 4
Back to Basic series

⁷² Written by *Richard Daniels*.

⁷³ Authors are *Richard Daniels* and *Walter Landmann*.

⁷⁴ By *Walter Landmann*.

2. Confederations of leather-based industry trade associations realized the importance of professional education and training and assumed their role as facilitators of development in this area at early stage of their existence. The policy of the CONFÉDÉRATION DES ASSOCIATIONS NATIONALES DE TANNEURS ET MÉGISSIERS DE LA COMMUNAUTÉ EUROPÉENNE (COTANCE)⁷⁵ outlined its strategy and activities in this respect as follows:⁷⁶



Education and training is a high priority for Europe's leather industry. European tanners understand that for a sustainable sectoral development the leather industry needs to consolidate and improve the level of skills of its workforce and COTANCE develops policies, activities and projects with this aim.

Europe's leather industry can count on the political action developed by COTANCE and the more operational activities undertaken by *Grouping of Europe's Leather Technology and Training Centres (GERIC)*, as well as through the social sectoral dialogue at EU level with the trade unions. COTANCE also contributes (recently) to the initiatives developed in the field of training certification developed by the INTERNATIONAL UNION OF LEATHER TECHNOLOGISTS AND CHEMISTS SOCIETY (IULTCS).

Europe still enjoys the World's best leather education/training structures with excellent tanning schools and training centres notably in Germany, Austria, Spain and UK (Italy's education and training system is more dispersed than in other countries), in France very practical partnerships have been build up with other education structures in the textile, clothing and leather (TCL) sectors. But also in Eastern Europe there are still leather education structures, notably in Poland, the Czech Republic, Romania and Bulgaria.

Europe is moving towards a knowledge based economy and its leather industry is not remaining behind, but there are some risks and challenges that need to be tackled for preserving for the global leather industry the excellent leather education and training structures that exist in Europe.

- The biggest risk is related to the image of the industry in the general public and the domestic decrease in appeal of leather education and training. Falling numbers of national schoolgoers is a risk for the economic sustainability of schools.
- The coordination and/or harmonization and/or equivalences of diplomas and qualification levels provided in the various national systems is also a serious challenge for the sector.
- Language is a barrier and a handicap for international development of schools (except English or Spanish and maybe French).
- International scholarships need to be further developed and managed in a fair way so that all structures can benefit from them.
- The chemical industry that also draws from the people that have been trained in the leather sector's structures needs to be more involved in the economic support of the leather sector's structures (example Germany). But there is also the risk that the best elements are always taken by chemical companies (better image, better pay, unfair competition).
- The decrease in knowledge regarding leather in certain leather articles manufacturing industries and notably in the retail sector, as well as in the general educational system.

COTANCE suggests that *leather education and training needs to go beyond its sectoral boundaries* and deal with issues such as architects, stylists, fashion world, construction industry, cosmetic industry, pharmaceutical industry, agriculture for by-products valorization, agriculture

⁷⁵ CONFEDERATION OF NATIONAL ASSOCIATIONS OF TANNERS AND DRESSERS OF THE EUROPEAN COMMUNITY.

⁷⁶ Electronic message by *Mr. Gustavo Gonzalez-Quijano*, Secretary General of COTANCE on 3/12/2009.

and husbandry for animal welfare and better care in breeding, housing and transporting animals for slaughter.

3. COTANCE, the CONFÉDÉRATION EUROPÉENNE DE L'INDUSTRIE DE LA CHAUSSURE (CEC)⁷⁷ and the EUROPEAN APPAREL & TEXTILE ORGANIZATION (EURATEX) supportively participated in commissioning of a comprehensive survey entitled “Skills scenarios for the textiles, wearing apparel and leather products sector in the European Union”. The study promotes the following recommendations related to professional education and training:

While TCL industries still have an excellent knowledge base in TCL production and commerce it is gradually vanishing not only through the declining number of jobs but also through declining training participation and the closure of training centres. Skills shortages appear in many companies even in countries with high unemployment rates. This has to be addressed to the weak competitiveness of TCL companies on labour and training markets. The removal of skills shortages therefore strongly depends on job and income perspectives in the sector. Facing this situation, it is recommended to apply a strongly selective human resources (HR) policy, concentrated on the regional centres of TCL production in Europe, particularly in France, Italy, Portugal, Germany and the new member states. Public investments into training structures need to be concentrated in order to modernize training. Universities could be at the centre of regional clusters in close cooperation with firms and intermediary training facilities. The goal can only be achieved if training centres are established in regions where TCL industries are developing promising business concepts, engage in R&D and established a strong value chains. There need to be a strong link between employers, training institutions and workers (trade unions).

Important segments of TCL *training* could be:

- specialty textiles;
- top quality production of garments, leather accessories, shoes;
- process and product innovation;
- interdisciplinary approaches with material science, chemistry, physics, and business administration;
- ecological aspects of TCL production and consumption.

Highly qualified engineers, designers, and business professionals are required for this. The *critical competences* which appeared in the scenarios should be developed:

- strategic and visionary management;
- intercultural competences in many functions;
- network-based value chain management;
- international marketing and branding;
- interdisciplinary and multi-skilled engineering;
- quality-oriented production;
- ecological knowledge as a cross-occupational competence.

4. **E-shoe learning**⁷⁸ was an EU project completed under the *Leonardo da Vinci* programme with the leadership of the Slovenian ZAVOD IRCUO industrial development centre for leather and footwear industries. It resulted three basic tools to support the technical development and to share knowledge in forms of
- a new footwear handbook with contemporary issues,
 - seminars on footwear product development and manufacturing,
 - a website offering basic and advanced knowledge, a discussion platform (forum) and an on-line testing facility to check the acquired knowledge (*Figure 5*).

⁷⁷ EUROPEAN CONFEDERATION OF THE FOOTWEAR INDUSTRY.

⁷⁸ <http://www.shoe-learn.com/index.php?lang=2>

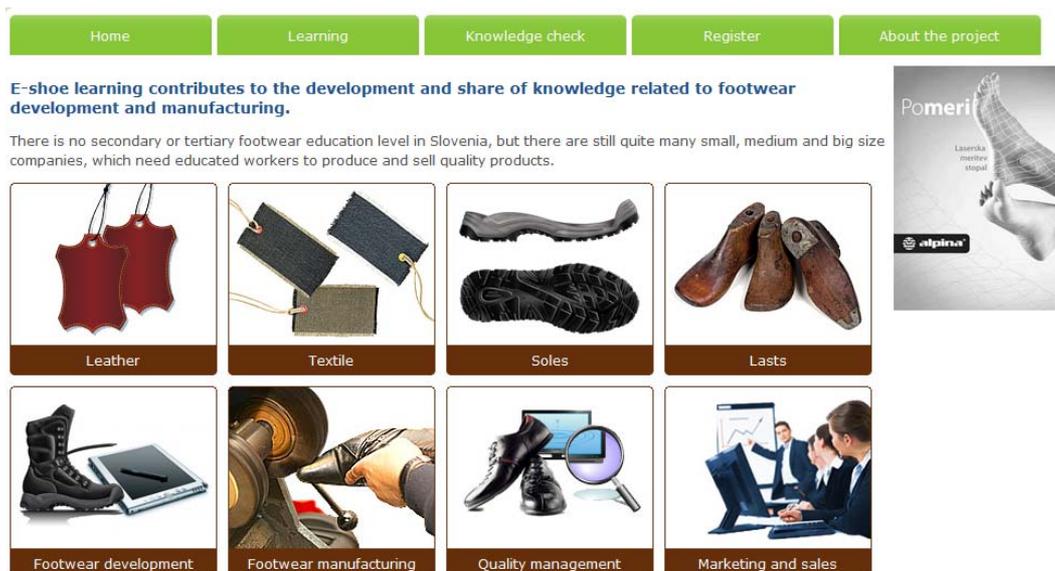


Figure 5
E-shoe learning website

5. There are other projects apparently being developed under the EU *Leonardo da Vinci* programme specifically for enhancing footwear technology training.⁷⁹

Title:

LE SCARPE MADE IN EUROPE - A European Laboratory to work out Standards of Competence and Models of Learning to promote knowledge of Shoe Products in Europe (Contract number: I/03/B/F/PP-154171)

Description:

The L.E.S.C.A.R.P.E. project aims at increasing the competitiveness of the European shoe industry through developing methodologies for training needs analysis and through the provision of vocational training courses.

The project will identify and define the professional skills necessary for those working in the shoe industry; to support employment and access to work through increasing individual skills levels.

Project activities will include the definition of common minimum standards of competence for several professional profiles within the shoe industry; development of methodologies for the analysis of training needs and the recognition and certification of skills acquired in the workplace.

Contracting organisation (promoter):

ISTITUTO ISTRUZIONE SUPERIORE EU RUZZA CON SEZIONE ASSOCIATA T PENDOLA

8, Via M. Sanmicheli, I-35123 Padova/Italy; Mrs. Maddalena Carraro

Tel.: +39 049 651090; Fax: +39 049 666398; E-mail: info@ruzzapendolapadova.it

⁷⁹ Joanna Basztura: Vocational Education and Training (VET) Policy and Leonardo da Vinci Programme. EUROPEAN COMMISSION, DG EDUCATION AND CULTURE – Lifelong Learning: Policies and Programme, Brussels, 8/11/2008.

Title:

SHOES-INNOVA – Nueva Herramienta de Aprendizaje para Crear valor en las PY-MEs Europeas del Sector del Calzado (*Contract number* : E/05/B/F/PP-149391)

Description:

The European production of shoes and footwear is at risk of decline, due to the aggressive competition of China. The shelter is named “high quality and fashion” and must be forged through a robust injection of new tech in the products and processes. The objective of the project is to upgrade the qualifications of workers in the European industrial and artisanal sector of shoes production, in order to contrast the current risk of decline.

Results and products: The prospective studies concerning Italy and Spain concerning the new trends in shoes production over the next 5 years (design, environment friendliness, materials, technology in the product and in the process) are an intermediate but important outcome, in order to understand the foreseeable developments in the sector. The training programme (manuals for the attended section of the training course) and the e-learning course on the web are the final results and products. Other products are the electronic (CD) and printed materials that shall be distributed in the context of the valorisation activities.

Potential future: The e-learning course produced for the shoes sector could be adapted for other sectors having a consistent component of manual handicraft.

Contracting organisation (promoter):

INSTITUTO TECNOLÓGICO DEL CALZADO Y CONEXAS ASOCIACION DE INVESTIGACIÓN (INESCOP)

Polígono Industrial, E-03600 Elda – Alicante/Spain; *M. Enrique Montiel*

Tel: +34 965 395 213; *Fax:* +34 965 381 045; *E-mail:* emontiel@inescop.es

Title:

Self Training for Tanneries - Auto-diagnosis of the training & self-training needs & availability of training in the tanning industry (*Contract number:* P/01/B/F/PP-125205)

Description:

The Self Training for Tanneries project will design and introduce a flexible, semi-autonomous training package to meet the training needs of the tanning industry. The project will develop a series of training (self-learning) modules and auto-diagnostic tools to analyse and respond to the training needs of the industry.

It will further design and introduce an evaluation tool for self-learning (to include a support manual for evaluators, questionnaires and key indicators) and will produce a guide to the application of developed methodologies.

The developed materials will form the contents of three specialist, self-learning kits to be developed at three levels (technician, middle manager and raw materials buyer) for output in five languages (PT, EN, DE, EL & PL), in both paper-based and electronic format (CD-ROM).

Contracting organisation (promoter):

CENTRO TECNOLÓGICO DAS INDUSTRIAS DO COURO (CTIC)

Sao Pedro, Apartado 158, 2384-909 Alcanena/Portugal; *M. Alcino Jose Pereira Martinho*

Tel.: +351 249 881577//891316; *Fax:* +351 249 881390;

E-mail: email@ctic.pt; *Website:* www.ctic.pt

Title:

NOVTEC - European Profile of CAD/CAM Technicians in Production Technologies in the Footwear Industry (*Contract number: P/01/B/F/PP-125224*)

Description:

The NOVTEC project will define the European profile of a Computer Aided Design and Computer Aided Manufacturing (CAD/CAM) technician working in the design and creation of footwear production machinery.

A training package will then be created to support the development of this new job profile. Following an initial needs analysis, the new job profile will then be outlined and objectives further clarified as regards the development of the training package.

The training package will be developed in three stages; firstly actual training modules will be developed (paper-based), secondly, modules will be adapted for release on CD-ROM and a further training guide produced (both in PT, IT, FI, DA & EN) and finally the outline training structure/job profile and process for end certification will be developed.

Contracting organisation (promoter):

RF-ENSINO E FORMAÇÃO PROFISSIONAL, LDA-ENTIDADE PROPRIETARIA DA ESCOLA PROFISSIONAL CENATEX

Avenida Conde Margaride 484/486, 4810-538 Guimaraes/Portugal

M. Rodrigo Maria Cortez Fragateiro

Tel.: +351 253 514728; Fax: +351 253 517568;

E-mail: ep.cenatex@mail.telepac.pt; Website: www.ep-cenatex.rcts.pt

Title:

Online Terminology Database within Textile, Clothing/Fashion and Footwear (*Contract number: DK/04/B/F/LA-145419*)

Description:

The project will develop an online language database consisting of terminology used in the textile, clothing/fashion and footwear industries. The database is intended for use by students in VET institutions in addition to existing employees requiring training.

The database will standardise terms and allow for ease of national and international business transactions by providing terminology, in different languages, on subjects from raw materials to semi-finished products.

The level of database language provision will target intermediate users and the languages offered will reflect those of the project partners, namely, DA, DE, CZ, EN, BG & TR.

The final product will consist of a standardised online template of terminology for the textile, clothing/fashion and footwear industries, in different languages, in the form of words/terms, pictures/drawings, explanations and definitions. The final version will also be produced in printed form for dissemination at trade fairs and educational institutions.

Contracting organisation (promoter):

HANDELSFAGSKOLEN

Rådhusgade 56, 8300 Odder/Denmark; *M. Ole Riis-Pedersen*

Tel.: +45 86 541700; Fax: +45 86 560686; E-mail: riis-p@handelsfagskolen.dk

6. **Master of Advanced Studies in Footwear Management & Technology** (MASFMT or simply FMT)⁸⁰ offers a modular learning path covering all aspects of the footwear life cycle: these include design (materials, modeling, style), production, management, customization, product de-commissioning and recycling. The courses offer fundamental knowledge, innovative tools, service and technologies for application in the footwear sector. The FMT aims to support the transformation of the footwear sector into a knowledge-based community. The master is devoted to managers, employees and technicians from the footwear sector as well as to people interested in working in this sector. The course contains 7 modules such as: management, production (base modules); quality, environment, comfort, custom and style.

⁸⁰ www.masfmt.supsi.ch

Students attend frontal lessons at the SCUOLA UNIVERSITARIA PROFESSIONALE DELLA SVIZZERA ITALIANA (SUPSI)⁸¹, exercise sessions and personal study in English. The Master degree is achieved with 60 ECTS⁸²: 49 following the lessons and with personal work and 11 ECTS preparing the final Project Work (1). It is possible to get a single Certificate of Advanced Studies (CAS) with 10 ECTS, following a module and preparing a Project Work (3 ECTS). The student can get a Diploma of Advanced Studies (DAS) with 30 ECTS, attending the two Base Modules plus 2 of the Specialization modules and preparing a Project Work (2 ECTS).

The FMT course is planned to start in February every calendar year and costs CHF 20,000 – this amount will be paid by installments as followed:

1st year: CHF 10,000 (CHF 5,000 at the moment of the subscription, CHF 5,000 in September)

2nd year: CHF 10,000 (CHF 5,000 in January, CHF 5,000 in September).

These amounts cover the subscription, the didactical material, the exams attendance and the final thesis discussion, certificates. The amount for the DAS is CHF 14,000 CHF to be paid in two installments. The amount for the CAS is CHF 5,000 to be paid at the moment of the subscription.

United Nations Efforts

UNIDO has always been engaged in institution building. There are leather technology centres (LTCs), common facility centres (CFCs), quality testing laboratories and specific professional educational institutes in a wide range of developing countries (e.g. in Brazil, Burkina Faso, Costa Rica, Egypt, Ethiopia, Eritrea, India, Indonesia, Kenya, Myanmar, Nigeria, Pakistan, Philippines, Tanzania, Tunisia, Uganda, Vietnam, Zimbabwe) imparting training to local leather-based industries and those in respective regions that had either be established or upgraded through UNIDO technical assistance projects. Furthermore, UNIDO has produced a large number of publications (could be) used in professional training.

The UNITED NATIONS ENVIRONMENTAL PROGRAMME (UNEP) in cooperation with UNIDO published technical papers on tannery pollution control. The FOOD AND AGRICULTURAL ORGANIZATION OF THE UNITED NATIONS (FAO), the INTERNATIONAL TRADE CENTRE (ITC) and especially the INTERNATIONAL LABOUR ORGANIZATIONS (ILO) also used to be involved in developing or supporting professional training related to their respective activities.

Annexes 4.1-4.4 offer some good examples of skill development and professional (re)training methods and courses implemented by UNIDO during the past decades.

⁸¹ UNIVERSITY OF APPLIED SCIENCES OF SOUTHERN SWITZERLAND.

⁸² ECTS – the European Credit Transfer System (ECTS) is the European Community standard for having equivalent University didactical formation.

RECOMMENDATIONS

1. In order to assist those (individuals, enterprises, institutions) looking for opportunities regarding professional education and/or training in any aspects of leather processing, leather products manufacturing and their support services a *comprehensive list of potential providers* (including R&D centres) may be compiled with a short description of their fields of operation and activities (or any other basic information they offer or deem relevant) with – most importantly – their accessibility and links to their home pages. UNIDO is encouraged to consider setting up an appropriate panel on its website and may volunteer to keep it updated as a public good to the leather-based industry and trade. Other option may be to involve COTANCE (for hides and skins, leather processing and related pollution control), UITIC and/or www.ShoelInfonet.com to provide such services.
2. UNIDO, in close cooperation with FAO, ILO, ITC and UNEP, may approach all known organizations worldwide – with special emphasis on those in developing countries – dealing with or imparting professional education and/or training in relation with leather-based industry technology (and perhaps trading) to encourage them *to sign up* and to keep updated their profile and/or programmes in the common database mentioned in recommendation 1 above.
3. UN specialized agencies such as FAO, ILO, ITC, UCTAD, UNEP, UNIDO, UNDP and perhaps WORLD BANK, with the involvement of international and regional federations and organizations (e.g. AFLAI, CEC, COTANCE, ESALIA, IULTCS, UITIC the Latin America Forum of Footwear Industries) should find appropriate means for *coordinating efforts* made and planned in relation professional education and training. UNIDO is best positioned to initiate and then lead the cooperation.
4. An analysis of strategies, plans and activities of leading national and bilateral development agencies (e.g. BRITISH COUNCIL, DANIDA, GTZET, NORAD, SIDA) and/or technical assistance programmes in relation to leather-based professional education and training may be initiated.
5. *Benchmarking* of professional education and training courses, activities or institutions would be of a very valuable orientation for the globalized leather-based industry. This would also assist training providers in finding their niches, in upgrading their services and adjusting their activities to actual needs of the industry. UNIDO should analyze the possibility of developing a benchmarking tool that could be applied either by UNIDO itself (e.g. through its technical assistance) or used it for self-assessment.
6. Modern, efficient, *ICT-based training methodology* should be developed for all levels and areas of leather processing and leather products manufacturing. UNIDO may take the initiative in compiling and disseminating information about GMP in this particular area.

QUESTIONNAIRE for Training Need Assessment (TNA)

Company profile (at present)

Products: Footwear Leather goods Leather garment Other

History: *years* (of operation/in business)

Products: type of *footwear* manufactured [%]

Gents/Men	Ladies/Women	Children	Total
			100%

Luxury (evening, dress, dance, formal etc.)	Everyday (street shoes for regular use)	Casual (leisure, comfort wear etc.)	Athletic (sports, jogging etc.)	Worker (safety, protec- tive etc.)	Special (e.g. theater, orthopedic)	Total
						100%

Products: type of *leather goods* manufactured [%]

Ladies hand- bags	Attaché/office cases	Travel goods	Flat/small leather goods	Belt	Total
					100%

Luxury (exclusive/high quality made of genuine leather)	Everyday (for regular use made of genuine leather)	Leather sub- stitutes (plastic, textile)	Special (e.g. for profes- sions, army)	Total
				100%

Target production volume: starting (6 months after opening) *pairs/day* or *pieces/day*
eventually (3-5 years later) *pairs/day* or *pieces/day*

Working regime: *hours/day* (total break time: *minutes*)
..... *days/week*

Technology [%] (footwear)

Stuck-on (ce- mented)	Stitched (stitched-down, Good-Year etc.)	Others (moccasins, injection moulding etc.)	Total
			100%

Equipment (number of electrically powered machines – pieces)

Footwear manufacturing

Cutting including component making and preparation	Closing (shoe upper making)	Making (lasting, soling, finishing)	Others (e.g. stores, transport)	Total

Leather goods manufacturing

Cutting including component making and preparation	Assembling (sewing, riveting, finishing etc.)	Others (e.g. stores, transport)	Total

Employment: number of labour/workers/employee [persons]

Direct labour		Technical		Management (line/plant supervisor, chief etc.)	Administrative (office employee, accounts, finance etc.)	Total
Un/semi-skilled can work without specific training (e.g. helper, cleaner)	Skilled need training and experience (e.g. cutter, stitcher, laster)	Product development (designer, pattern cutter or grader)	Technicians (technologist, time study, maintenance, storekeeper, sales etc.)			

Female	Male	Total
		100%

Characteristic of *present* labour and staff

Qualification of employees [%]

None	Basic or elementary school	Secondary school	Higher education	Total
				100%

Experience/time required for acquiring present skills of operators/direct labour [%]

1-6 months	7-12 months	1-3 years	4-10 years	11+ years	Total
					100%

Opinion of the presently **available professional education** at the *[name(s) of local institutions]*.

a) Regular education:

- duration:
- theoretical knowledge:
- practical skills:

b) Special courses:

Knowledge obtained by employees (obtained from *other* than AL-AMERIA)

Area/subject <i>(describe the kind of knowledge obtained)</i>	Institution	Duration		Year
		years	hours	

Remark: One row for one education/training (i.e. if one person participated in several schools/courses then each of them should be shown in different rows).

Company plans for relocated/new plant

Products: Footwear Leather goods Leather garment Other

Products: type of *footwear* to be manufactured [%]

Gents/Men	Ladies/Women	Children	Total
			100%

Luxury (evening, dress, dance, formal etc.)	Everyday (street shoes for regular use)	Casual (leisure, comfort wear etc.)	Athletic (sports, jogging etc.)	Worker (safety, protec- tive etc.)	Special (e.g. theater, orthopedic)	Total
						100%



Products: type of *leather goods* to be manufactured [%]

Ladies hand-bags	Attaché/office cases	Travel goods	Flat/small leather goods	Belt	Total
					100%

Luxury (exclusive/high quality made of genuine leather)	Everyday (for regular use made of genuine leather)	Leather substitutes (plastic, textile)	Special (e.g. for professions, army)	Total
				100%

Production volume: *pairs/day* or *pieces/day*

Working regime: *hours/day* (total break time: *minutes*)
..... *days/week*

Technology [%] (footwear)

Stuck-on (cemented)	Stitched (stitched-down, Good-Year etc.)	Others (moccasins, injection moulding etc.)	Total
			100%

Equipment (number of electrically powered machines – pieces)

Footwear manufacturing

Cutting including component making and preparation	Closing (shoe upper making)	Making (lasting, soling, finishing)	Others (e.g. stores, transport)	Total

Leather goods manufacturing

Cutting including component making and preparation	Assembling (sewing, riveting, finishing etc.)	Others (e.g. stores, transport)	Total

Employment: number of labour/workers/employee [persons] – *at start*

Direct labour		Technical		Management (line/plant supervisor, chief etc.)	Administrative (office employee, accounts, finance etc.)	Total
Un/semi-skilled can work without specific training (e.g. helper, cleaner)	Skilled need training and experience (e.g. cutter, stitcher, laster)	Product development (designer, pattern cutter or grader)	Technicians (technologist, time study, maintenance, storekeeper, sales etc.)			

Female	Male	Total
		100%

Employment: number of labour/workers/employee [persons] – *later (full capacity)*

Direct labour	Technical	Management	Administrative

Professional Education and Training in the Leather-based Industries

F. Schmél

Un/semi-skilled can work without specific training (e.g. helper, cleaner)	Skilled need training and experience (e.g. cutter, stitcher, laster)	Product development (designer, pattern cutter or grader)	Technicians (technologist, time study, maintenance, storekeeper, sales etc.)	(line/plant supervisor, chief etc.)	rative (office employee, accounts, finance etc.)	Total

Female	Male	Total
		100%

Required labour skills and staff knowledge

Required skill level from physical workers (direct labour, operators)

PREPARATION				UPPER MAKING				SHOE ASSEMBLING			
Operation	S	½	U	Operation	S	½	U	Operation	S	½	U
Gen. leather cutting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Splitting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Insole fixing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Textile/synth.* cutting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Skiving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Stiffener fixing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sole leather cutting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Stitch marking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Backpart moulding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sheet** cutting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Stamping/numbering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pulling over/toe last	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heel building/making	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Interlining fusing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Heel seat lasting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sole/heel edge trim	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Edge folding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Side lasting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit sole roughing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lining stitching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Welt stitching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applying adhesives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Decorative stitching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lasted shoe shaping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Painting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Upper stitching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Roughing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cleaning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Edge trimming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Apply adhesive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Packaging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Eyeleting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sole laying/pressing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality inspection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Upper/boot moulding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sole stitching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cleaning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sole edge trimming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Threading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sole edge moulding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Quality inspection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Shoe last removing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Heel attaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					Sock lining fixing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					Painting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					Cleaning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					Quality inspection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					Packaging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Remarks: S – skilled; ½ – semi-skilled; U – unskilled

*Textile, canvas, thin plastic (leather substitute, coated fabric, felt, poromerics etc.) materials normally cut in multi-layers.

**Thicker sheet (leather substitute) materials such as paperboard, leatherboard (LE-FA), rubber, polyurethane etc.

....Add new items as required.

Kind of **professional education/training** services required

Level	Modality			Approximate duration		
	Regular (full time daily)	Ad-hoc (short, evening, weekend)	In-plant (on the job)	year	month	hour
Semi-skilled operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Skilled operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Plant/line supervisors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Designers/pattern makers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Technologists	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Marketing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Entrepreneur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

Quantitative requirement in skilled/trained personnel

Level	For the starting operation	Future years
	<i>person</i>	<i>person/year</i>
Semi-skilled operators		
Skilled operators		
Plant/line supervisors		
Designers/pattern makers		
Technology		
Marketing		
Entrepreneurship		
....		
Total		

Employee *re*training preferences

	Full time	Evening: 4-5 hours/day			Weekend: 5-7 hours/day	
		<i>2 days/week</i>	<i>3 days/week</i>	<i>5 days/week</i>	<i>1 day/weekend</i>	<i>2 day/weekend</i>
Semi-skilled operators	<input type="checkbox"/>					
Skilled operators	<input type="checkbox"/>					
Plant/line supervisors	<input type="checkbox"/>					
Designers/pattern makers	<input type="checkbox"/>					
Technologists	<input type="checkbox"/>					
Marketing	<input type="checkbox"/>					
Entrepreneurship	<input type="checkbox"/>					
....	<input type="checkbox"/>					
	<input type="checkbox"/>					

Substantive training requirementsExamples of possible *operator retraining* courses (*not* full list)

Course	Subject	Modality		Required	
		Theory	Pract.	Yes	No
Genuine leather cutting	Materials (topography, faults, grains etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Equipment (machines, blocks, dies etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Products and patterns (orientation, perimeters etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Surface manipulation (cutting schemes)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Costing (yield, wastes etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Workplace organization (layout, movements)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Manual leather cutting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shoe upper sewing	Basic skills (threading, guiding, machine control etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Combined skills (stitching etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Threads, needles, seams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Quality requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Machines and tools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Types and construction of footwear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Lining systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Required subjects to be available for *short-term staff retraining* (*not* full list)

Courses and subjects	Priority	
	High	Low
Design and pattern engineering – complete course	<input type="checkbox"/>	<input type="checkbox"/>
Shoe lasts (geometry, construction, sizes)	<input type="checkbox"/>	<input type="checkbox"/>
Fashion forecasts, trends and their interpretation (seasonally)	<input type="checkbox"/>	<input type="checkbox"/>
Range (collection) building	<input type="checkbox"/>	<input type="checkbox"/>
Manual pattern engineering and cutting (everyday footwear)	<input type="checkbox"/>	<input type="checkbox"/>
Special styles (sandals, boots, moccasins, athletic) pattern engineering	<input type="checkbox"/>	<input type="checkbox"/>
Pattern grading (theory)	<input type="checkbox"/>	<input type="checkbox"/>
Computer Aided Design (CAD)	<input type="checkbox"/>	<input type="checkbox"/>
Component design (manual)	<input type="checkbox"/>	<input type="checkbox"/>
Shoe fitting	<input type="checkbox"/>	<input type="checkbox"/>
Footwear technology – complete course	<input type="checkbox"/>	<input type="checkbox"/>
Cutting technology – complete course	<input type="checkbox"/>	<input type="checkbox"/>
Genuine leather cutting	<input type="checkbox"/>	<input type="checkbox"/>
Leather substitute cutting	<input type="checkbox"/>	<input type="checkbox"/>
Component (insole, stiffener, toe-puff, sole, heel) pre-manufacturing	<input type="checkbox"/>	<input type="checkbox"/>
Upper making – complete course	<input type="checkbox"/>	<input type="checkbox"/>
Sewing operations and equipment: needles, threads, seams, machines	<input type="checkbox"/>	<input type="checkbox"/>
Reinforcing and interlinings	<input type="checkbox"/>	<input type="checkbox"/>
Shoe assembling – complete course	<input type="checkbox"/>	<input type="checkbox"/>
Adhesion: adhesives, surfaces, processes, equipment	<input type="checkbox"/>	<input type="checkbox"/>
Shoe finishing: chemicals, techniques, equipment, testing	<input type="checkbox"/>	<input type="checkbox"/>
Quality assurance and management – complete course	<input type="checkbox"/>	<input type="checkbox"/>
Leather grading and quality control	<input type="checkbox"/>	<input type="checkbox"/>
Quality inspection in shoe production	<input type="checkbox"/>	<input type="checkbox"/>
Laboratory tests	<input type="checkbox"/>	<input type="checkbox"/>
Marketing – complete course	<input type="checkbox"/>	<input type="checkbox"/>

Courses and subjects	Priority	
	High	Low
Market research and competition assessment	<input type="checkbox"/>	<input type="checkbox"/>
Branding	<input type="checkbox"/>	<input type="checkbox"/>
Production management – complete course	<input type="checkbox"/>	<input type="checkbox"/>
Work measurement (standard times, movements)	<input type="checkbox"/>	<input type="checkbox"/>
Process/line balancing	<input type="checkbox"/>	<input type="checkbox"/>
Payment methods and incentives	<input type="checkbox"/>	<input type="checkbox"/>
Ergonomics	<input type="checkbox"/>	<input type="checkbox"/>
Logistics: storage management and internal transport	<input type="checkbox"/>	<input type="checkbox"/>
Production planning (scheduling)	<input type="checkbox"/>	<input type="checkbox"/>
Production systems and layouts (lines, groups, rinks)	<input type="checkbox"/>	<input type="checkbox"/>
Production supervision	<input type="checkbox"/>	<input type="checkbox"/>
Costing and pricing	<input type="checkbox"/>	<input type="checkbox"/>
Entrepreneurship – complete course	<input type="checkbox"/>	<input type="checkbox"/>
Business strategy and environment analysis	<input type="checkbox"/>	<input type="checkbox"/>
Competition analysis and market positioning, marketing strategy	<input type="checkbox"/>	<input type="checkbox"/>
Legal aspects of business operation, employment and taxes	<input type="checkbox"/>	<input type="checkbox"/>
Financial aspects of business operation, banking, balance sheets	<input type="checkbox"/>	<input type="checkbox"/>
Opportunity and feasibility studies	<input type="checkbox"/>	<input type="checkbox"/>
Management principles and practice	<input type="checkbox"/>	<input type="checkbox"/>
Foreign trade	<input type="checkbox"/>	<input type="checkbox"/>
....	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>

(Re)training plan: number of employees to be enrolled for (re)training

Participant	Area/subject	Start	Start+1	Start+2
Operators (direct labour)	Genuine leather cutting			
	Other material cutting			
	Shoe upper maker			
	Sewing machinist			
	Shoe assembling			
Staff (technical, managerial)	Design and range building			
	Pattern engineering			
	Pattern grading			
	Footwear technology – general			
	Cutting technology			
	Shoe upper making technology			
	Shoe assembling			
	Quality assurance			
	Marketing			
	Production management			
	Entrepreneurship			
....			
TOTAL				

Training opportunities and courses in leather and leather products manufacturing Worldwide*

Country	Institution	Subject/Course	Type		Duration	Fee
			Part	Full	<i>h</i>	US\$**
Argentina	CEFOTECA	Shoe upper cutting			188	
		Shoe upper making			268	
		Shoe assembling			188	
Brazil	CTC/SENAI	Product design development			80	
		Technology development for supervisors			80	
		Production and sample making – I			80	
		Production and sample making – II			120	
		Iconography technical research			20	
		Creative production			40	
		Planning techniques			40	
		Advanced patter making			45	
		Advanced design			60	
		Shoe last development			48	
		ShoeMaster CAD system			96	
		Leather garment pattern making			80	
		Shoe construction concepts			8	
		Laboratory managers' upgrading			24	
		Quality inspection – compromise with excellence			8	
		Quality inspection – towards excellence			8	
		Footwear technology (4 modules)			1,700	
		Line supervisor			804	
		Production supervisor (manager)			690	
		Fundamentals of quality control in high quality footwear prod.			25	
Fundamentals of industrial costing			80			
Fundamentals of leather goods pattern making			120			

Country	Institution	Subject/Course	Type		Duration	Fee
			Part	Full	<i>h</i>	US\$**
		Fundamentals of time studies			60	
		Fundamentals of planning and production control			51	
		Use of leather and synthetics in garment manufacturing			120	
		Fundamentals of shoe upper cutting			100	
		Fundamentals of shoe upper sewing			150	
		Basic shoe design			110	
		Basics of sewing machine maintenance			90	
		Basic shoe pattern making – I			110	
		Basic shoe component pattern making			80	
		Concepts of sole prototyping			120	
		Basics of total quality management			32	
		Interpretation and implementation of ISO 17025:2005			24	
		Interpretation of criteria – compromise with excellence			16	
		Interpretation of criteria – towards excellence			16	
		ISO 9001:2000 – Interpretation and implementation			16	
		Update for trainers and instructors of children			80	
		Speaking and presenting			15	
Colombia	CIENNOVA	Leather goods design and product development			30	638
France	CTC	Shoe city (introduction)	#		14	1,292
		Footwear manufacturing	#		7	
		Discover footwear manufacture	#		35	
		Sport shoes	#		7	700
		Sport shoes: concepts and production	#		21	
		Children shoes	#		14	1,292
		Responsible sourcing	#		21	
		Leather accessories: footwear and leather goods	#		14	1,292

Country	Institution	Subject/Course	Type		Duration	Fee
			Part	Full	<i>h</i>	US\$**
		Leather in footwear and leather goods	#		7	
		Textiles in footwear	#		7	646
		Introduction of rapid prototyping	#		7	
		Shoe lasts	#			
		Soles	#			
		Eco concept in footwear and leather goods	#			
		Surface calculation	#			
		Standard times	#			
		Time standards and productivity	#			
		Costing	#			
		Production control	#			
		Quality control of footwear and leather garment	#		7	646
		Constraints marketing	#		7	
		Factory audit	#		7	
		Professional footwear – safety shoes	#		7	646
	INSTITUTE COLBERT	Collection building – role of production manager	#		16	920
		Purchasing management in distribution	#		16	920
		Textiles and consumers' benefits	#			
		Leather in footwear and leather goods	#		8	1,168
		Knowledge of footwear	#		8	1,168
		Retail management	#		16	1,074
		Technical approach to China	#		16	1,074
		Facts about design and colors	#		24	467
Hungary	TECHNORG	Analytical genuine leather cutting training	#		320	
		Analytical sewing machinist training	#		320	
		Cutting/sewing instructor	#		120	

Country	Institution	Subject/Course	Type		Duration	Fee
			Part	Full	<i>h</i>	US\$**
		Line/plant supervisors	#	#	80	
		Quality assurance	#	#	40	
		Footwear CAD	#	#	80	
		Leather goods CAD	#	#	40	
India	CFTI AGRA	Footwear designing and product development	#			
		Basic design and pattern engineering	#		600	235
		Crash course in footwear design and production	#		840	351
		Operator's course in clicking and material technology	#			
		Supervisor's course in upper closing technology	#			
		Operator's course in lasting and bottom making	#		160	70
		Certificate course in shoe CAD	#		192	94
		Advanced certificate course in shoe CAD	#		140	
		Certificate course in CAD 3D modeling	#		320	350
		Certificate course in CAD 3D modeling and & CNC	#		480	585
	CLRI***	Quality control methods in footwear manufacture	#		160	235
		Executive training in footwear manufacture	#		160	235
		CAD/CAM for footwear	#		80	175
		Sole mould design and manufacture	#		80	350
		Unit sole making	#		40	118
		Shoe finishing	#		24	70
		Machine operations for footwear	#		40	118
		Executive training in leather goods manufacture	#		160	235
		Maintenance of machines in leather goods and garments	#		80	70
		Executive training in leather garments manufacture	#		160	235
		Leather garment pattern designing		#		235
		CAD for garments	#		160	235

Country	Institution	Subject/Course	Type		Duration	Fee
			Part	Full	<i>h</i>	US\$**
		Trainer – pedagogy	#		120	128
		Analysis of arylamine-based dyes	#		40	235
		Consequence analysis of chemical accidents	#		16	94
		Hazard and operability studies	#		16	94
		Safety audit	#		8	47
		Advances in process safety and quantitative hazard assessment	#		16	94
Italy	ARS SUTORIA	Footwear modelist-designer	#		480	
		Advanced stylist training	#		160	
		Footwear CAD-CAM	#		160	
		Leather goods modelist-designer	#		160	
	CERCAL	Footwear pattern making and design	#		1,000	10,837
		Leather goods design	#		800	9,155
		Planning high fashion collection	#		120	2,880
		The quality of “Made in Italy” product	#		36	1,020
Mexico	CIATEC	Basic shoe design and fashion cycles	#		40	
		Basic shoe pattern making	#		246	
		Advanced shoe pattern making	#		180	
		Pattern making for force-lasted (Strobel) shoes	#		40	
		Special pattern development	#		30	
		Shoe manufacturing technology	#		116	
		Handbag manufacturing	#		116	
		Leather goods from genuine leather	#		60	
		Sewing machine setting and maintenance	#		54	
		Saving electric power	#		40	
		Hydraulic systems	#		40	
		Pneumatic systems	#		40	

Country	Institution	Subject/Course	Type		Duration	Fee
			Part	Full	<i>h</i>	US\$**
		Quality control workshop	#		40	
		Quality management systems and ISO 9001:2000	#		20	
		Physical testing of leather	#		20	
		Physical testing of synthetic soles	#		20	
Spain	INESCOP	Quality assurance in shoe and component making		#	48	Free
		Computer assisted shoe technology and design	#		265	
		Footwear technology, quality and production control		#	48	
		Evaluation of shoe functionality		#	21	
		Workshop on PU water dispersions	#		10	
		3D shoe pattern engineering		#	54	
		Electronic data exchange in shoe production		#	20	146
		Computer-aided cutting of shoe components		#	30	4,210
		Computer assisted shoe last design			20	2,808
		CAM in shoe last grading and production			20	2,808
		CAD pattern engineering - I			20	2,808
		CAD pattern engineering - II			20	2,808
		CAD in shoe modeling			20	2,808
		CAD in heel design – I			20	2,808
		CAD in heel design – II			20	2,808
		CAD in shoe machine design			20	2,808
		Implementation of automated cutting			20	2,808
		Vulcanized sole model making using computers			30	4,210
		ISO 9000 in shoe factories			20	2,808
		Quality management tools in shoe production			12	1,683
Quality management – application of ISO 9001:000			12	1,683		
Standardization and certification in the shoe industry				12	1,683	

Country	Institution	Subject/Course	Type		Duration	Fee
			Part	Full	h	US\$**
		Knowledge of shoe materials			20	2,808
		Quality control in the shoe industry			20	2,808
		Adhesion and adhesives in shoe production			20	2,808
United Kingdom	ISF	Footwear technology	#		300	
		Footwear design	#		300	
		Footwear instructors	#		300	
		Footwear CAD/CAM	#		300	
		Footwear appreciation	#		30	
	LONDON COLLEGE OF FASHION	Diploma in footwear	#		1,350	2,330
		Introduction to sewing techniques	#		40	
		Boot making		#	40	
		Surface pattern for leather	#	#	40	767
	SATRA	Basic shoemaking	#		14	1,033
Restricted substances		#		8	521	

Remarks: *The table does not include all training courses available in the World, it is rather an overview and demonstration of ranges and types/kinds of training opportunities offered by various institutions. These courses are subject to sufficient interest (number of applications) and as such may be conducted only once or repeatedly.

**Fees are approximate figures as they are set in local currencies and are converted into US\$ for easy comparability.

*** Same courses available for foreigners for US\$ 500-1,500

Trade associations related to leather-based industries

Organization	Abbreviation	Hides	Leather	Shoe	Leather goods	Machinery	Technicians	Country	Website	E-mail	Fax
Asociación Argentina de los Químicos y Técnicos de la Industria del Cuero	AAQTIC		X				X	ARG		presidencia@aaqtic.org.ar	54 (11) 4982-5550
Cámara Argentina de Industriales Proveedores de la Industria del Calzado	CAIPIC			X				ARG	www.caipic.org.ar	caipic@caipic.org.ar	54 (11) 4981-5689
Cámara de la Industria del Calzado	CIC			X				ARG	www.calzadargentino.org.ar	comercio@camara-calzado.org.ar	54 (11) 4958-3742
Cámara de la Industria Curtidora	CICA		X					ARG	www.cica.org.ar	ewydler@cica.org.ar	54 (11) 4983-8502
Cámara Industrial de las Manufacturas del Cuero y Afines de la República Argentina	CIMA				X			ARG	www.cuerocima.com.ar	cima@cuerocima.com.ar	54 (11) 4307-9848
Australian Hide, Skin and Leather Exporters' Association	AHSLEA	X	X					AUL	www.ahslea.com.au	gsbanks@ozemail.com.au	+612 9686 3303
Fachverband der Ledererzeugenden Industrie			X					AUS	www.leather-industry.at	fvleder@wko.at	43 1 50105 278
Fachverband der Lederverarbeitenden Industrie				X	X			AUS		fvleder@wkoesk.wk.or.at	43 1 50 20 62 78
Fédération Belge de l'Industrie de la Chaussure A.S.B.L.	FEBIC			X				BEL	www.febic.be	febic@vidac.be	32 2 736 12 76
Bangladesh Finished Leather, Leather Goods and Footwear Exporters Association	BFLLFEA		X	X	X			BGD		dilf@bol-online.com	+88 2 8622167
Bangladesh Tanners Associations	BTA		X					BGD		leather.info@gmail.com	+88 2 8628508
Asociacion Boliviana de Quimicos y Tecnicos de la Industria del Cuero	ABOQUITEC		X				X	BOL		aboquit@supernet.com.bo	59 (4) 422-726
Asociacion Departamental de Industriales del Cuero de Cochabamba	ADIC		X					BOL		curtiembre-america@bo.net	
Leather Industry Association of Botswana	LIAB	X	X					BOT		lpaya@gov.bw	+267-3914-236
Associação Brasileira dos Exportadores de Calçados	ABAEX			X				BRA	www.abaex.com.br	abaex@pnet.com.br	55 (51) 595-2362
Associação Brasileira de Estilistas de Calçados e Afins	ABECA						X	BRA	www.abeca.org	abeca@abeca.org	55 (51) 3587-4889

Organization	Abbreviation	Hides	Leather	Shoe	Leather goods	Machinery	Technicians	Country	Website	E-mail	Fax
Associação Brasileira das Indústrias de Artefatos de Couro e Artigos de Viagem	ABIACAV				X			BRA	www.abiacav.org.br	abiacav@abiacav.org.br	
Associação Brasileira das Indústrias de Calçados	ABICALÇADOS			X				BRA	www.abicalcados.com.br	bf@abicalcados.com.br	55 (51) 594-8011
Associação Brasileira dos Químicos e Técnicos da Indústria do Couro	ABQTIC		X				X	BRA	www.abqtic.com.br	fernanda@abqtic.com.br	55 (51) 3561-2761
Associação Brasileira das Indústrias de Máquinas e Equipamentos para os Setores do Couro, Calçados e Afins	ABRAMEQ					X		BRA	www.abrameq.com	abrameq@abrameq.com	55 (51) 3594-2296
Associação Brasileira de Empresas de Componentes para Couro, Calçados e Artefatos	ASSINTECAL		X	X	X			BRA	www.assintecal.org.br	assintecal@assintecal.org.br	55 (51) 3584-5201
Centro das Indústrias de Curtumes do Brasil	CICB		X					BRA	www.brazilianleather.com.br	cicb@terra.com.br	55 (61) 3323-7943
Branch union of Leather, Furriers, Footwear and Haberdashery Industries	BULFFHI		X	X	X			BUL	www.leather-shoes.eu	info@leather-shoes.eu	359 2 9589508
Fur Council of Canada	FCC		X					CAN		canfur@generation.net	
Asociación Chilena de Químicos y Técnicos del Cuero	ACHIQTEC		X				X	CHI		jorge@jordec.cl	56 (2) 525-1299
Asociación de Productores e Industriales del Cuero y Calzado	APICCAL			X	X			CHI		asociacion@apiccal.tie.cl	56 (2) 223-2214
Asociación Gremial de Industriales del Calzado	ASINCAL			X				CHI			
Asociación de la Industria de Curtiembres	ASINCUR		X					CHI			56 (2) 465-3316
Federación del Cuero, Calzado y Afines de Chile	FEDECCAL		X	X	X			CHI		fedeccal@entelchile.net	56 (2) 480-7689
Asociación Colombiana de Industriales del Calzado, el Cuero y sus Manufacturas	ACICAM	X	X	X	X			COL	www.acicam.com	presidencia@acicam.org	57 (1) 341-8995
Asociación Colombiana de Químicos y Técnicos de la Industria del Cuero	ACOLCUR		X				X	COL	www.acolcur.org	oficina@acolcur.org	(6) 3357085
Asociación Nacional de Empresarios de Colombia: Camara Sectoral del Cuero	ANDI		X					COL			57 (6) 335-7085
Union Nacional del Cuero y el Calzado	UCC		X	X				COL			
Guangdong Shoes Manufacturers Association	CFA			X				CPR	www.cantonfootwear.org	secretariat@cantonfootwear.org	86-20-3616 8666

Organization	Abbreviation	Hides	Leather	Shoe	Leather goods	Machinery	Technicians	Country	Website	E-mail	Fax
Chinese Leather Association	CLA		X					CPR	www.chineseleather.org	market@chineseleather.org	020-8381 6902
China Leather Industry Association	CLIA	X	X	X				CPR		clia@china-leather.com	86 (10)5231698
Guangdong Shoes Materials Association	GDSMA			X				CPR	www.gdsma.com	Info@gdsma.com	020-61443221
Association of Textile-Clothing-Leather Industry	ATOK		X					CZE	www.atok.cz	atok@atok.cz	420 224 805 339
Czech Leather and Fur Association	CKKA			X				CZE		ckka.belik@jaro.cesnet.cz	420 442 816056
Ceská Obuvnická a Kozedelná Asociace	COKA		X					CZE	www.coka.cz	coka@coka.cz	420 577 525 230
Asociación Nacional de Curtidores del Ecuador	ANCE		X					ECU	www.ance.com.ec	presidencia@ance.com.ec	593 (3) 854-564
Asociación de Fabricantes de Calzado del Ecuador	ASOFACAL				X			ECU		asofacal@andinanet.net	+593 (2) 469-104
Cámara de Calzado de Tungurahua	CALTU			X				ECU		caltu@andinanet.net	(593) 3 242 2915
Cámara Ecuatoriana de Calzado, Cuero y Conexos	CAMEC		X	X	X			ECU		asofacal@andinanet.net	59 (3) 2246-9104
Chamber of Leather Industry	CLI			X				EGY		leather@starnet.com.eg	20 2 3908016
Chamber of Leather Tanning and Fur	CLTFI		X					EGY		cltfi@ritsec.com.eg	20 2 3934098
Asociación de Empresarios de Tenerías de El Salvado	AETES		X					ELS		ccadtz@es.com.sv	503 338-5039
Eritrean Leather and Allied Industries Association	ELAIA	X	X	X	X			ERI		elaia@gemel.com.er	+291-1-124274
Ethiopian Leather Industries Association	ELIA		X					ETH	www.elia.org.et	elia@ethionet.et	251 11 550893
Ethiopian Tanners Association	ETA		X					ETH		tanners@tclecom.net.et	251 518098
Shoe and Leather Industry Association	SLIA		X	X				FIN		antti.rissa@lapna.fi	358-9-630.225
Association of Finnish Shoe and Leather Industries			X	X				FIN		sari.vannela@ryhma.ttliitot.fi	358 9 179 588
Association Française des Ingénieurs Chimistes et Techniciens des Industries du Cuir	AFICTIC		X				X	FRA	www.ctc.fr/afictic	afictic@ctcgrupe.com	+33 (0) 4 72 76 10 01
Association Française des Techniciens des Industries de la Chaussure	AFTIC			X			X	FRA	www.ctc.fr/afic	p_bonnet@worldnet.fr	04 72 76 10 01
Conseil National du Cuir	CNC		X					FRA	www.leatherfrance.com	fftm@leatherfrance.com	33 (0) 1 43 59 30 02
Fédération Française de la Tannerie-Mégisserie	FFTM	X	X					FRA	www.leatherfrance.com	fftm@leatherfrance.com	33-1-42.93.37.448

Organization	Abbreviation	Hides	Leather	Shoe	Leather goods	Machinery	Technicians	Country	Website	E-mail	Fax
Federation Nationale des Détaillants en Maroquinerie et Voyage	FNDMV				X			FRA	www.fndmv.or	info@fndmv.org	09.50.35.89.52
Fédération Nationale de l'Industrie de la Chaussure de France	FNICF			X				FRA		chaussuredefrance@laposte.fr	33 1 46227152
Federation des Chambres Syndicales de la Ganterie de Peau de France	GANT FRANCE				X			FRA	www.lescreateursfrancaisducuir.org		33 5 55029491
Bureau de Style Des Industries de la Chaussure, de la Maroquinerie et du Cuir				X			X	FRA		b2styles@b2styles.com	33 1 44710404
Federation de la Maroquinerie					X			FRA	www.ff-marquinerie.fr		33 1 46078789
Bundesverband Lederwaren und Kunststoffzeugnisse e.V.	BVLK				X			GER	www.lederwarenverband.de	info@lederwarenverband.de	49 (69) 81 28 10
Hauptverband der Deutschen Schuhindustrie e.V.	HDS			X				GER	www.hds-schuh.de	b.braun@hds-schuh.de	49 69 812810
Verband der Deutschen Lederindustrie e.V.	VDL		X					GER	www.vdl-web.de	Info@vdl-web.de	069 78 80 00 09
German Machinery and Plant Manufacturers' Association	VDMA					X		GER	www.vdma.org	magdalena.kraut@vdma.org	49 (89) 27 82 87-22
Pirmasenser Schuhindustrie Techniker e.V.				X			X	GER		BGST.PS@t-online.de	
Hellenic Association of Footwear Manufacturers and Exporters	ELSEVIE			X				GRE	www.elsevie.gr	elsevie@hellasnet.gr	30 1 674.44.97
Hellenic Tanners' Association	HTA		X					GRE		htsa@otenet.gr	30-2610-647.3068
Gremial de Curtidores de Cuero	GCC		X					GUA		info@industriaguade.com	502 (2) 914-883
Gremial de Calzado de Guatemala	GCG			X				GUA	www.grecalzaguade.com	grecalza@intelnet.net.gt	502 (2) 380-9110
Hong Kong Leather Shoe and Shoe Material Merchants Association Ltd.	HKLSASMM AL			X				HOK	www.hktdc.com		2396 6020
Hong Kong Hide & Leather Traders' Association Ltd.		X	X					HOK	www.leatherassn.com	info@leatherassn.com	(852) 2783 0804
Hong Kong Rubber and Footwear Manufacturers' Association Ltd.				X				HOK			852 397 6927
Scientific Society of the Leather, Shoe and Allied Industries	BCBTE	X	X	X	X		X	HUN	www.bcbte.org	info@bcbte.org	36 (1) 369-1058
Association of Leather and Footwear Industry	BCE	X	X	X	X			HUN	www.bcefair.hu	bce@t-online.hu	36 (1) 251-5887
Agra Footwear Manufacturers & Exporters. Chamber	AFMEC			X				IND	www.afmec.org	afmec_agra@airtelmail.in	

Organization	Abbreviation	Hides	Leather	Shoe	Leather goods	Machinery	Technicians	Country	Website	E-mail	Fax
All India Leather Machinery Manufacturers Association	AILMMA					X		IND			91 33 329 1096
All India Skin & Hide Tanners & Merchants Association	AISHTMA		X					IND	www.aishtma.com	aishtma@vsnl.com	91 44 5365292
Council for Leather Export	CLE		X	X	X			IND	www.leatherindia.org	cle@cleindia.com	44- 28594363/64
Indian Footwear Components Manufacturers Association	IFCOMA			X				IND	www.ifcoma.org	ifcoma@vsnl.com	91-120-2411572
Indian Finished Leather Manufacturers & Exporters Association	IFLMEA		X					IND	www.iflmea.net	associate@iflmea.net	91-44-28411057
Indian Leather Garments Association	ILGA				X			IND		ilga@ilga.com	+91 118 4545 921
Indian Leather Products Association	ILPA				X			IND			91-(33)-22267102
Indian Leather Technologists Association	ILTA		X				X	IND	www.iltaonleather.com	leather1a@bsnl.in	91 332207472
Indian Shoe Federation	ISF			X				IND		infoshoeFed@vsnl.net	91-(44)-28413704
All India Small Scale Tanners and Exporters Association	ISSTEA		X					IND			91 44 564 641
Tanners Federation of India	TFI		X					IND			+91 512 210684
West Bengal Leather Goods Manufacturers & Exporters Association					X			IND			
Indonesian Tannery Association	APKI		X					INS	www.indonesiantanners.com	agit@puntoyuwono.com	
Indonesian Footwear Manufacturers Association	APRISINDO			X				INS	www.aprisindo.info	aprisindo@vision.net.id	62 21 344 7572
Association of the Leather Producers and Exporters of East Azarbaijan			X					IRA	www.ea-leather.com	info@ea-leather.com	+98 411 526 0808
Federation of Irish Footwear Manufacturers				X				IRE			353 42 33 371
Italian Association of Manufacturers of Fine and Speciality Chemicals	ACFIS		X					ITA			39 2 26810364
Italian Leather Chemists' Association	AICC		X				X	ITA		info@aicc.it	39 571 35625
Associazione Italiana Manifatturieri Pelli e Succedanei	AIMPES				X			ITA		segreteria@mipel.it	258451320
Associazione Nazionale Calzaturieri Italiani	ANCI			X				ITA	www.ancionline.com	info@anci-calzature.com	39 2 48005833

Organization	Abbreviation	Hides	Leather	Shoe	Leather goods	Machinery	Technicians	Country	Website	E-mail	Fax
Associazione Promozione della Cultura e Tecnica Calzaturiera	APCTC			X			X	ITA			39 0734 993280
Associazione dei Costruttori di Macchine per Calzature e Pelletteria	ASSOMAC					X		ITA	www.assomac.it	info@assomac.it	39 038 188 602
Unione Nazionale Industria Conciaria	UNIC		X					ITA	www.unic.it	info@unic.it	39-02-72.00.00.72
Groupement National des Export de Peaux et Cuir		X						IVC		latourterelle1965@yahoo.fr	+225 03 208865
Japanese Association of Leather Technology	JALT		X				X	JAP		yoshimura.keiji@member.metro.tokyo.jp	+81-3-3616-1676
Japan Leather & Leather-Goods Industries Association	JLIA		X	X	X			JAP			81 3 3847 1510
Shoe Technologists Association of Japan	STAJ			X			X	JAP			
Tanners' Council of Japan	TCJ		X					JAP		tcj@jibasan.or.jp	81 792 82 6703
All Japan Bag Industry Federation					X			JAP			03 38517725
Toto Shoe Manufacturers' Association				X				JAP			81 3 3876 3396
Kenya Tanners Association	KTA	X	X					KEN			+254 2 445344
Association of Leather Producers and Consumers of Lithuania	LOGVA		X	X	X			LIT		tedela@takas.lt	370-41-5253058
Malaysian Footwear Manufacturers Association	MFMA			X				MAL	www.malaysiafootwear.com	info@malaysiafootwear.com	60 3 984 5664
Asociacion Nacional de Curtidores	ANACU	X						MEX		anacur@leon.intermex.com.mx	52 (47) 167-077
National Association of Leather Goods Manufacturers	ANFRAPIEL				X			MEX			52 (47) 117-801
Asociación Nacional de Proveedores de para la Industria del Calzado	ANPIC			X	X			MEX	www.anpic.com	anpic@anpic.com	52 (477) 711-2139
Federación Mexicana de Químicos y Técnicos del Cuero	AQTCL		X				X	MEX		aqtcl@prodigy.net.mx	52 (477) 716-4043
Cámara Nacional de la Industria del Calzado	CANAICAL			X				MEX		expocalza_canaical@yahoo.com	52 55 25 49 62
Cámara de la Industria del Calzado del Estado Guanajuato	CICEG			X				MEX	www.ciceg.org	comunicacion@ciceg.org	52 (477) 152-9005
Camara de la Industria del Calzado del Estado de Jalisco	CICEJ			X				MEX	www.cicej.com.mx	modama@cicej.com.mx	(33) 3853.4983

Organization	Abbreviation	Hides	Leather	Shoe	Leather goods	Machinery	Technicians	Country	Website	E-mail	Fax
Camara de la Industria de Curtiduria del Estado de Guanajuato	CICUR		X					MEX	www.cicur.org	presidencia@cticur.org	52 (477) 713-5154
Association Ouest-Africaine du Cuir	ASOAC		X					MLW		contact@asoac-cuir.org	+223 222 60 26
Leather Association of Malawi	LAM	X	X					MLW		marvinkamthunzi@yahoo.com	
Federation Marocaine des Industries du Cuir	FEDIC				X			MOR	www.cuirmaroc.com	fedic@menara.ma	212 2 227299
Leather Industries Association of Namibia	LIAM	X	X					NAM			
Leather Footwear and Goods Manufacturer's Association of Nepal	LFGMAN			X				NEP		lfgman@hotmail.com	+977-01-4219349
Nepal Leather Industries Association	NLIA	X	X					NEP		gris@atc.net.com.np	+977-01-4240491
Federatie van Nederlandse Lederfabrikanten	FNL		X					NET		fnl@wispa.nl	31-13-594.47.498
Federatie Nederlandse Lederwaren- en Schoenfabrikanten	FNLS				X			NET	www.fnls.nl	fnls@wispa.nl	013- 594 47 48
Federatie van de Nederlandse Schoenfabrikanten	FNS			X				NET		info@schoenfederatie.nl	31 13 594.47.49
Nederlandse Schoenmakers Vereniging	NSV			X				NET	www.schoenmaker.nl	info@schoenmaker.nl	31 226-421637
Asociación de Teneros Nicaraguenses	ATEN		X					NIC			
Cámara Nicaraguense del Cuero, Calzado, Marroquinería y Talabartería			X	X	X			NIC			
Norske Garveriers Landsforeningen			X					NOR		mail@borge-garveri.no	47-56-19.36.018
Teko Landsforening				X				NOR		firmapost@teko.no	47 22 59 66 94
Asian Sports and Allied Industries Federation	ASAIF				X			PAK		hasnain@yours.com	92 432 590 076
Leather Industry Development Organization	LIDO		X	X	X			PAK			92 51 812246
Pakistan Footwear Manufacturing Association	PFMA			X				PAK	www.pakfootwear.org	pfma@pfma.lcci.org.pk	92 42 5750052
Pakistan Tanners Association	PTA	X	X					PAK	www.pakistantanners.org	info@pakistantanners.org	92 21 5880093
Asociación Paraguaya de Químicos y Técnicos de la Industria del Cuero	APQUITEC		X				X	PAR		rarrom@infonet.com.py	

Organization	Abbreviation	Hides	Leather	Shoe	Leather goods	Machinery	Technicians	Country	Website	E-mail	Fax
Cámara de Empresas Artesanas del Paraguay	CEAP		X	X	X			PAR	www.ceap.org.py	info@ceap.org.py	
Cámara de la Industria de la Curtiduría	CIC	X	X					PAR		raul@amigo.com.py	595 (21) 22-407
Cámara de la Industria del Calzado Paraguayo	CICPAR			X				PAR		cic_py@hotmail.com	675 056
Unión Industrial Paraguayan	UIP		X	X	X			PAR			
Asociacion de Pequeños y Medianos Fabricantes de Calzado	APEMEFAC			X				PER		apemefac@terra.com.pe	51 (1) 3329078
Corporacion del Cuero, Calzado y Afines de Peru	CCCA		X	X	X			PER		corporaciondelcueroycalzado@sni.org.pe	51 (1) 421-8830
Association of Philippine Leather Goods Exporters and Manufacturers	APLEM				X			PHI		aplem@hotmail.com	(632) 646-5925
Philippine Footwear Federation Inc.					X			PHI		rogerpyjr@yahoo.com	+63 (2) 941-1178
Polska Izba Przemyslu Skórzanego	PIPS		X	X	X			POL	www.pips.pl	pips@pips.pl	48 42 636 09 24
Associação Portuguesa dos Industriais de Curtumes	APIC		X					POR	www.apic.pt	apic@mail.telepac.pt	351 249 88 91 99
Associação Portuguesa dos Industriais de Calçado, Componentes e Artigos de Pele e seus Sucedâneos	APICCAPS			X				POR		apiccaps@mail.telepac.pt	351 2 507.41.79
Korean Footwear Exporters Association	KFIA			X				ROK	www.kfia.co.kr		82-2-3273-0525
Pusan Footwear Manufacturers Association	PFMA			X				ROK		webmaster@pfma.co.kr	82-51-637-4802
Asociatia Producatorilor de Piele si Blana din Romana	APPBR		X					ROM		appb.ro@gmail.com	40-21.323.52.80
Association of Romanian Shoe Producers				X				ROM		anca.balan@chronos-serv.ro	+40 56 190427
National Footwear Association of Russia	NFAR			X				RUS	www.nfar.ru	info@nfar.ru	095 928 71 71
South Africa Footwear and Leather Industries Association	SAFLIA			X	X			SAF		footfed@telkomsa.net	27-31-701 4208
South African Skin, Hide and Leather Council	SASHLC		X					SAF		oosthaw@intercom.co.za	27-(41) 365 3299
Zväz kožiarskeho a obuvníckeho priemyslu Slovenskej republiky	ZKOP		X	X				SLO	www.zkop.sk	zkop@zkop.sk	421 33 5501282
Asociación de la Industria de la Piel para el Comercio Exterior	ACEXPIEL		X					SPA	www.leather-spain.com	inform@leather-spain.com	34 93 458 50 61

Organization	Abbreviation	Hides	Leather	Shoe	Leather goods	Machinery	Technicians	Country	Website	E-mail	Fax
Asociación Comarcal de Industriales del Calzado del Alto Vinalopó	ACICAV			X				SPA	www.empresas.inescop.com/A_SO_VILLENA/	altovi@inescop.es	34 96 5807213
Asociación Española de Empresas de Componentes para el Calzado	AEC			X	X			SPA	www.fcfs.es	aeacc@aeacc.com	34 96 667 37 12
Asociación de Modelistas Españoles de Calzado y Marroquinería	AMEC			X	X		X	SPA		amec@abserver.es	34 96 539 98 06
Asociación Química Española de la Industria del Cuero	AQEIC		X				X	SPA	www.aqeic.org	aqeic@aqeic.org	+93 691 20 07
Asociación Española de Fabricantes de Marroquinería, Artículos de Viaje y Afines	ASEFMA				X			SPA	www.asefma.com	asefma@asefma.com	34 91 319 07 37
Confederación Española de Curtidores	CEC-FECUR		X					SPA	www.leather-spain.com	secretaria@leather-spain.com	34-93-458.50.618
Asociación Española de Técnicos de la Industria del Calzado	EATIC			X			X	SPA			34 96 5381045
Federación de Industrias del Calzado Español	FICE			X				SPA	www.fice.es	info@fice.es	+34 (91) 562 00 94
Organización Empresarial Española de la Peletería	OEEP		X					SPA	www.oEEP.net	oEEP@empresas.inescop.com	91 310 35 07
Asociación de Fabricantes de Calzado y Zapatillas Vulcanizadas				X				SPA			34 968 632266
Leather and Shoe Chamber (of the Sudanese Chamber of Industries)			X	X				SUD			+249 11 471 720
Svenska Garveriïdkareforeningen	SG		X					SWE		Christina.lennartsson@elmoleather.com	46-325.61.14.778
Sveriges Skomakarmästarförbund				X				SWE	www.skomakare.com	info@skomakare.com	46 8-6620696
Swedish Federation of Footwear Industry				X				SWE			46 19 30.66.50
Verein Schweizerischer Lederindustrie-Chemiker	VELSIC		X				X	SWI	www.veslic.ch		
Verband Schweizerischer Schuhindustrieller	VSS			X				SWI			41 62 8493889
Verband Schweizerischer Gerbereien			X					SWI	www.leder-gerbereien.ch	gallusser@leder-gerbereien.ch	41-71-744.65.598
Arab Union for Leather Industries				X				SYR	arableather@net.sy	arableather@net.sy	+963 11 4465661
Thai Footwear Association	TFA			X				THA	www.thaifootwear.or.th	info@thaifootwear.or.th	662 274 4752

Organization	Abbreviation	Hides	Leather	Shoe	Leather goods	Machinery	Technicians	Country	Website	E-mail	Fax
Thai Leathergoods Association	TLA				X			THA	www.thaileathergoods.net	admin@thaileathergoods.net	662 0 2645 3509
Thai Tanning Industry Association	TTIA		X					THA	www.thaitanning.org	president@thaitanning.org	+66 (02) 703-8431
Tunisian Association of Technicians of Leather and Footwear	ATTIC		X	X			X	TUN		s.fkih@utica.org.tn	216 71 432 283
Fédération Nationale du Cuir et de la Chaussure	FNCC		X	X				TUN		fed.cuir@utica.org.tn	216.1.787.740
Aykkabl Yan Sanayicileri Derneği	AYSAD		X					TUR	www.aysad.org	info@aysad.org	90 212 549 36 22
İstanbul Deri Organize Sanayi Bölgesi	DETEK		X				X	TUR	www.detek.org.tr	detek@detek.org.tr	+90 216 394 01 04
İstanbul Tekstil ve Konfeksiyon İhracatçı Birlikleri Genel Sekreterliği	ITKIB			X	X			TUR	www.itkib.org.tr	info@itkib.org.tr	90 212 4540201
Türkiye Ayakkabi Sanayicileri Derneği	TASD		X					TUR	www.tasd.com.tr	info@tasd.com.tr	90 212 549 71 17
Türkiye Deri Sanayicileri Derneği	TDSD		X					TUR	www.tdsd.org.tr	tdsd@tdsd.org.tr	90 216 394 07 42
Taiwan Association of Machinery Industry	TAMI					X		TWN	www.tami.org.tw	shoetech@tami.org.tw	886-2-23813711
Taiwan Footwear Manufacturers Association	TFMA			X				TWN	www.footwear-assn.org.tw	ken119@ms21.hinet.net	886-2-5081489
Boot and Shoe Manufacturers' Association	BASMA			X				UK			
British Footwear Association	BFA			X				UK	www.britfoot.com	info@britfoot.com	44 (0) 1933 225009
Society of Leather Technologists and Chemists	SLTC		X				X	UK	www.sltc.org	88088540gsl@nene.ac.uk	44 1604 35932
UK Leather Federation	UKLF		X					UK	www.uklf.org	info@uklf.org	44-1604-67.99.98
Ukrainian Leather and Shoe Association			X	X				UKR	www.leatherua.com	leather@ukr.net	
Leather Association of Tanzania	LAT	X	X					URT		muyinga@hotmail.com	+255 22 2863230
Asociación Uruguaya de la Químicos y Técnicos de la Industria del Cuero	AUQTIC		X				X	URU	www.cueronet.com/auqtic	auqtic@cueronet.com	(5982) 698 3442
Camara de la Industria del Calzado	CIC			X				URU		cicul@adinet.com.uy	(5982) 902 09 95
Cámara de la Industria de la Vestimenta de Cuero					X			URU			(5982) 900-1941/42
American Apparel & Footwear Association	AAFA			X				USA	www.apparelandfootwear.org	dvandyke@apparelandfootwear.org	1 703-524-1864

Organization	Abbreviation	Hides	Leather	Shoe	Leather goods	Machinery	Technicians	Country	Website	E-mail	Fax
American Leather Chemists Association	ALCA		X				X	USA	www.leatherchemists.org	alca@leatherchemists.org	806.744.1785
Leather Industries of America Inc.	LIA		X					USA		nfo@leatherusa.com	1 202 342 8583
Luggage and Leather goods manufacturers of America Inc.	LLGMA				X			USA			
Shoe Service Institute of America	SSIA			X				USA	www.ssia.info	webmaster@ssia.info	410-569-8333
United States Hide, Skin and Leather Association	USHSLA	X	X					USA	www.ushsla.org	jreddington@meatami.com	(202) 587-4250
Asociación Peruana de Químicos y Técnicos del Cuero	APEQTIC		X				X	VEN			
Cámara Venezolana de Fabricantes de Componentes y Productos Afines para el Calzado	CAFACA			X				VEN		directiva@cafaca.com	058-02 2647867
Cámara Venezolana del Calzado y Componentes	CAVECAL		X	X				VEN	www.cavecal.org.ve	cavecal@cantv.net	58 (212) 575-4342
Cámara Venezolana de Curtidores	CVC		X					VEN		michelecas@cantv.net	58 (241) 616-2713
Vietnam Leather and Footwear Association	LEFASO		X	X				VIE	www.lefaso.org.vn	hhdg@hn.vnn.vn	84 4 9345374
Leather Industries Association of Zambia	LIAZ		X					ZAM		liazcf@zamnet.zm	+260 1 286 053
Leather Institute of Zimbabwe	LIZ	X	X	X	X			ZIM		liz@netconnect.co.zw	+263-09-882 757

Sequence: by countries

Leather and leather products related R&D institutions

Institution	Abbreviation	Leather	Footwear	Others	Country	Website	E-mail	Fax
Centro de Investigación y Desarrollo del Cuero	CITEC	X			ARG		citec@inti.gov.ar	+54 221 484 0244
Centre de recherches techniques et scientifiques des Industries de la tannerie, de la Chaussure, de la Pantoufle et des autres Industries transformatrices du Cuir	CRC-CLO	X	X		BEL			
Centro Tecnológico Couro, Calçados	CTCC	X	X		BRA		ctcc@pb.senai.br	+50 83 333 2451
Instituto Brasileiro de Tecnologia do Couro, Calçados e Artefatos	IBTeC	X	X	X	BRA	www.ibtec.org.br	ibtec@ibtec.org.br	+55 (51) 3553-1001
Centro Tecnológico de Couros e Calçados	IPT/CTCC	X	X		BRA		iptctcc@francanet.com.br	+55 16 720 0980
Laboratório de Estudos em Couro e Meio Ambiente	LACOURO	X			BRA		mariliz@enq.ufrgs.br	+55 51 3316 3277
The CORD Group Limited	CORD	X	X	X	CAN	www.cordgroup.ca	cord@istar.ca	+1 902-465-2717
Centro Tecnológico para las Industrias del Calzado, Cuero y Afines	CEINNOVA	X	X		COL	www.ceinnova.org.co	alvaro.rojas@ceinnova.org.co	+57 (1) 338-1072
China Leather & Footwear Industrial Research Institute	CLFI	X	X		CPR	www.clf.cn		+86 (10) 64362594
China National Information Center for Shoemaking Industry					CPR			+86 (10) 6417846
Centro de Investigación y Desarrollo del Calzado	CIDEC	X	X		CUB			
Institut pro testování a certifikaci a.s. Zlín	ITC	X	X		CZE	www.itezlin.cz	itc@itezlin.cz	+420 (577) 601 387
Leather & Leather Products Technology Institute	LLPTI	X	X	X	ETH		llpti@telecom.net.et	+251 1 34 22 59
Centre Technique du Cuir, Chaussure, Maroquinerie	CTC	X	X	X	FRA	www.ctcgroupe.com	contact@ctcgroupe.com	+33 472 76 10 00
Institut Colbert			X	X	FRA		colbert@enam-paysdelaloire.fr	02.41.49.22.57
Forschungsinstitut für Leder und Kunststoffbahnen	FLIK	X			GER	www.filkfreiberg.de	mailbox@filkfreiberg.de	+49 3731 366-130
Lehr-, Prüf- und Forschungsinstitut	LGR	X			GER	www.lgr-reutlingen.de	lgr@lgr-reutlingen.de	+49 07121-162311

Institution	Abbreviation	Leather	Footwear	Others	Country	Website	E-mail	Fax
Prüf-und-forschungsinstitut für die Schuhherstellung e V.	PFI		X		GER	www.pfi-ps.de	info@pfi-pirmasens.de	+49-6331/24906
ELKEDE Technology and Design Centre SA	ELKEDE	X	X		GRE	www.elkede.gr	elkede@elkede.gr	+30 210 2846471
BIMEO Testing & Research Ltd Co	BIMEO	X	X		HU N	www.bimeo.hu	bimeo@bimeo.hu	+36 (1) 369-1058
Central Leather Research Institute	CLRI				IND	www.clri.org	clrim@vsnl.com	+91-44-24912150
Central Leather Research Institute	CLRI	X	X	X	IND	www.clri.org	clrim@vsnl.com	+91 444 911 589
Footwear Design and Development Institute	FDDI				IND	www.fddiindia.com	fddi@vsnl.com	+91(120) 2412556
Footwear Design & Development Institute	FDDI		X	X	IND	www.fddiindia.com	fddi@vsnl.com	+91(120) 2412556
Centre for Leather, Rubber and Plastics	CLRP	X	X	X	INS	www.bbkkp.go.id	bbkkp@jogjamedianet.com	(274)563655
Institute for Research and Development of Leather and Allied Industry	IRDLAI	X	X		INS			
Centro Eccellenza Qualita'	CEQ	X	X	X	ITA	www.ceq.it	lab@ceq.it	+39 0572955707
Centro Servizi Calzaturiero	CESECA		X		ITA	www.ceseca.it	segreteria@ceseca.it	39 0583 926310
Centro Italiano Materiali di Applicazione Calzaturiera	CIMAC	X	X		ITA	www.cimacpv.it	cimac@cimacpv.it	+39 0381 73393
Stazione Sperimentale Industria del le Pelli e delle Materie Concianti	SSIP		X		ITA	www.ssip.it	ssip@iol.it	+39 081265574
Laboratorio Anatomia della Calzatura			X		ITA	www.shoesverona.com	fabio.cabianca@shoesverona.com	
Technical Support Center for Leather Industries	TSCLI	X			JAP			+81-792-22-9043
Kenya Industrial Research & Development Institute	KIRDI	X	X		KEN	www.kirdi.go.ke	dir@kirdi.go.ke	+254-35-41992
Centro de Innovación Aplicada en Tecnologías Competitivas	CIATEC	X	X	X	ME X	www.ciatec.mx	informes@ciatec.mx	+52 (477) 761-0900
ARMONO Corporation	ARMONO	X	X	X	MO N		armono@mongol.net	+976-11-342536
Institut Spécialisé des Métiers du Cuir	ISMC	X			MO R		imc@marocnet.net.ma	+212 22 838 264
Leather and Shoe Research Association of New Zealand	LASRA				NZE	www.lasra.co.nz	lasra@xtra.co.nz	+64 (06) 354-1185
New Zealand Leather and Shoe Research Association	LASRA	X	X		NZE	www.lasra.co.nz	lasra@xtra.co.nz	+64 (06) 354-1185

Institution	Abbreviation	Leather	Footwear	Others	Country	Website	E-mail	Fax
Leather Research Centre	LRC	X			PAK	www.pcsir.gov.pk/Leather_Res_Cent_main.html		92-51-9258167
National Institute of Leather Technology	NILT	X			PAK		nilt@khi.paknet.com	+92-21-35065429
Centro de Innovacion Tecnologica del Cuero, Calzado e Industrias Conexas	CITECCAL	X	X		PER	www.citeccal.com.pe	diseciteccal@produce.gob.pe	+51 (1) 382-0115
Centralne Laboratorium Obuwniczego w Krakowie	CLPO		X		POL	www.ips.krakow.pl	clpo@clpo.com.pl	+48 12 266 91 54
Instytut Przemysłu Skórzanego	IPS	X	X		POL	www.ips.lodz.pl		+48 42 657 62 75
Centro Tecnológico do Calçado	CTC		X		POR	www.ctcaldado.pt	ctc@mail.ctcaldado.pt	+351 256 832 554
Centro Tecnológico dos Industrias do Couros	CTIC	X			POR	www.apic.pt/ctic	ctic@mail.telepac.pt	+35 124 988 13 90
Korean Institute of Footwear and Leather Technology	KIFLT	X	X		ROK	www.kiflt.re.kr	webmaster@kiflt.re.kr	+82 51 897 9766
Institutul National de Cercetare - Dezvoltare Pentru Textile si Pielarie	CERTEX	X			RO M	www.certex.ro	certex@ns.certex.ro	+40 (21) 340.55.15
Institutul de Cercetare Pielarie-Încaltaminte	ICPI	X	X		RO M	www.icpi.ro	icpi@icpi.ro	+40 (21) 323.52.80
Techno-Shoe Comptoria			X		SIN		technoshoe@gmail.com	+65-6253 1417
Instituto de Biomecanica de Valencia	IBV		X		SPA	www.ibv.org	bv@ibv.upv.es	+34 96 387 91 69
Instituto Español del Calzado Y Conexas Asociacion de Investigacion	INESCOP		X		SPA	www.inescop.es	info@inescop.es	+34 6 5381045
National Leather Technology Center	IRCC	X	X		SUD	www.ircc.gov.sd/leather_dept.htm	nltc_sudan@yahoo.com	+249-1-85-0154928360
Industrijsko Razvojni Center za Usnjarsko in Obutveno Industrijo	IRCUO		X		SVN	www.ircuo.si	info@ircuo.si	+386 4 51-91-422
Universal Customization System	UCS		X		SVN	www.ucstech.eu	info@ucstech.eu	+386 (1) 7507130
Centre National du Cuir et de la Chaussure	CNCC	X	X		TUN	www.cnccleather.nat.tn	cncc.dt@email.ati.tn	+216 71 432 283
Taiwan Footwear Research Institute	TFRI	X	X		TW N			886 4 3590837
BLC Leather Technology Centre Ltd	BLC	X			UK	www.blcleathertech.com	info@blcleathertech.com	+44 (0) 1604 679998
Intertek Testing Services UK Footwear & Leathersgoods Testing	ITS		X	X	UK	www.intertek-labtest.com	labtest.uk@intertek.com	+44 116 263 0311

Institution	Abbreviation	Leather	Footwear	Others	Country	Website	E-mail	Fax
SATRA Footwear Technology Centre	SATRA		X	X	UK	www.satra.co.uk	info@satra.co.uk	+44 1536410626
Laboratorio Tecnológico del Uruguay	LATU	X	X		URU	www.latu.org.uy	atencionalcliente@latu.org.uy	+598 (2) 600-2291
Leather Research Institute	LRI	X			USA	www.orgs.ttu.edu/leatherresearchinstitute	lri@hs.ttu.edu	+18 067421005
Leather Institute				X	USA	www.leatherinstitute.com	info@leatherinstitute.com	+1.732.530.3440
Leather Research Laboratory of the University of Cincinnati		X			USA	www.leatherusa.org	coryni@uc.edu	+15 132429797
Oklahoma State University-Okmulgee Small business Occupations Dpt.		X			USA	www.orgs.ttu.edu/leatherresearchinstitute	information@osu-okmulgee.edu	+1 918 293 4650
Leather Institute of Zimbabwe	LIZ	X	X		ZIM		venturecapital@zpf.co.zw	+263 9 775 65

Sequence: by countries

Fashion [education and/or training] institutions

Institution	Abbreviation	Country	Website	E-mail	Fax
PCVO Waas en Durme	PCVO	BEL	www.shoedesign.be	info@pcvowd.be	+32 09 340 51 19
Distribución y Desarrollo de la Moda del Calzado	DIDEMOCAL	CHI			
Lycée d'Alembert GRETA de la mode	GRETA	FRA	lyc-dalembert.scola.ac-paris.fr	dal@lycee-dalembert-paris.org	+33 1 42 01 20 44
Lycée de la Mode		FRA	www.lycee-mode.com	equipe.lycee@lycee-mode.com	+33 2 41 71 28 55
Schule für Mode, Grafik, Design		GER	www.schule-mode-grafik-design.de	info@schule-mode-grafik-design.de	+49 (69) 70 72 06 9
National Institute of Fashion Technology	NIFT	IND	www.nift.ac.in	ce.ho@nift.ac.in	
ARS Arpel Group Srl	ARS-ARPEL	ITA	www.arsapel.it	arsapel@arsapel.it	+39 02 33611.619
ModaPelle Academy	MODAPELLE	ITA	www.modapelle.com	info@modapelle.com	+39 02 33501 391
Guanajuato World Trade Commision	COFOCE	MEX	www.cofoce.gob.mx	cofoce@cofoce.gob.mx	52 (477) 763-0088
Coordinadora de Fomento al Comercio Exterior del Estado de Guanajuato	COFOCE	MEX	www.cofoce.gob.mx	cofoce@cofoce.gob.mx	+52 (477) 736-0088
Instituto Nacional de la Moda	INNMODA	MEX	www.innmoda.calza.com	innmoda@prodigy.net.mx	52 4 714 41 68
Centru Virtual de Instruire Pentru Proiectarea Încălțămintei	VTC-SHOE	ROM	www.vtcforshoedesign.com	amihai@tex.tuiasi.ro	
Centro Superior de Diseño de Moda	CSDMM	SPA	www.csdmm.upm.es	cdocum@csdmm.upm.es	+34 91 332 17 67
I.E.S. Sixto Marco	IES	SPA	www.iesixtomarco.edu.gva.es	03005082@centres.cult.gva.es	+34 965 45 90 45
London College of Fashion - Cordwainers College		UK	www.lcf.linst.ac.uk/cms.cgi/site	international@fashion.arts.ac.uk	+44 (0) 20 7514 7656
International Shoemaking Design	ISD	USA	www.internationalshoemakingdesign.com		

Sequence: by countries

Leather-related professional education and training institutes

Institution	Abbreviation	Education	Training	Leather	Footwear	Leather goods	Others	Country	Website	E-mail	Fax
Centro Formación Recursos Humanos y Tecnología Industria Calzado	CEFOTECA	X	X		X			ARG	www.calzadargentino.org.ar/cefoteca-acercade.asp	cefoteca@camara-calzado.org.ar	+54 11 49813203
Bangladesh College of Leather Technology	BCLT	X	X	X	X			BGD	www.bclt.com.bd	bclt@bol-online.com	+88 02 8617439
Centro Tecnológico do Calçado SENAI	CT CALÇADO	X	X		X			BRA	www.senairs.org.br/ctcalçado	ctcalçado@senairs.org.br	+55 (51) 3594-4676
Centro Tecnológico do Couro SENAI	CT CUORO	X	X	X				BRA	www.senairs.org.br/ctcouro	mmoreira.couro@senairs.org.br	+55 (51) 3561-1864
Serviço Brasileiro de Apoio às Micro e Pequenas Empresas	SEBRAE		X	X	X	X	X	BRA	www.sebrae.com.br	annap@sebrae.com.br	+55 (61) 3348-7263
Centre des Métiers du Cuir de Montréal	CMCM		X			X		CAN	www.cmcm.qc.ca	ecolecuir@cmcm.qc.ca	+1 (514) 270-0429
Commission Scolaire de la Région de Sherbrooke	CSRS	X					X	CAN	www.csrs.qc.ca		+1 819 822-5530
Universidad Diego Portales	UDP		X		X			CHI	www.udp.cl		
Servicio Nacional de Aprendizaje	SENA	X	X	X	X	X		COL	www.sena.edu.co		
Escuela de Química U.C.R - Laboratorio de la Unidad de Servicio a la la Industria del Cuero, Sección Análisis Químicos y Físicos del Cuero	UCR							COS		psylva@calzada.equi.ucr.ac.cr	(506) 253-5020
Wenzhou Vocational and Technical College		X			X			CPR	www.wzvtc.cn	daijiali10@hotmail.com	+86-577-86680090
Tomas Bata University in Zlín	TBU	X	X	X	X			CZE	www.utb.cz	studium@ft.utb.cz	+420 57 721 0722
Servicio Ecuatoriano de Capacitación Profesional/Centro de Formación Industrial Ambato	SECAP		X		X			ECU	www.secap.gov.ec	secapsugerencias@secap.gov.ec	
Escuela de Calzado		X	X		X			ECU			
Hämeen Ammattikorkeakoulu	HAMK	X	X		X			FIN	www.hamk.fi	HAMK@hamk.fi	+358-3-6463600

Institution	Abbreviation							Country	Website	E-mail	Fax
		Education	Training	Leather	Footwear	Leather goods	Others				
Association pour la Formation dans la Maroquinerie	AFORMA							FRA		aforma@forthac.fr	01 42 44 22 45
Association Nationale pour la Formation Professionnelle des Adultes	AFPA		X		X	X		FRA			
Association pour la Formation Professionnelle des Industries du Cuir	APIC	X	X	X	X	X	X	FRA	www.afpic.com	n.bourgeois@afpic.com	+33 1 48 10 00 05
Fachhochschule Kaiserslautern	FH-KL		X					GER	www.fh-kl.de	presse@fh-kl.de	+49 (0)631 / 37 24
Fachschule Textil & Schuhe	LDT	X	X		X			GER	www.ldt.de	post@ldt.de	+49 7452 8409-40
Lederinstitut Gerberschule Reutlingen	LGR	X	X	X				GER	www.lgr-reutlingen.de	lgr@lgr-reutlingen.de	+49 7121162311
International Shoe Competence Center	ISC	X	X		X			GER	www.isc-pirmasens.de	info@isc-pirmasens.de	+49 (0) 6331 145 334
Modell Divatiskola		X				X	X	HUN	www.modelldivatiskola.hu	info@modelldivatiskola.hu	+36 (1) 351-1093
Central Footwear Training Institute - Agra	CFTI							IND	www.cftiagra.org.in	info@cftiagra.org.in	+91-562-2642004
Central Footwear Training Institute - Chennai	CFTI							IND		cfti@vsnl.net	+91 44-22336876
College of Leather Technology	CLT	X	X	X				IND	www.indiastudycenter.com	clt@vsnl.net	+91 33 23356997
Indian Institute of Leather Products	IILP							IND			
Indonesian Footwear Design Development Institute								INS		indai_yg@plasa.com	
Centro Ricerca e Scuola Internazionale Calzaturiera	CERCAL	X	X		X			ITA	www.cercal.org	cercal@cercal.org	+39 0541 932999
Istituto di Certificazione della Qualità per l'Industria Conciaria	ICEC	X		X				ITA	www.icec.it	icec@icec.it	+39 (02) 72000072
Istituto Professionale di Stato per l'Industria e l'Artigianato	IPSIO	X	X		X	X		ITA		ipsia.fermo@sapienza.it	+39 0734 224349
Istituto Tecnico Industriale for Tanning Chemistry "G.Galilei"	ITIS	X	X	X				ITA	www.istitutoconciario.com	info@istitutoconciario.com	+39 0444 450920
Politecnico Internazionale per lo Sviluppo Industriale ed Economico	PISIE		X		X	X	X	ITA	www.pisie.it	pisie@pisie.it	+39 055 2646000

Institution	Abbreviation	Education	Training	Leather	Footwear	Leather goods	Others	Country	Website	E-mail	Fax
Politecnico Calzaturiero			X		X			ITA	www.politecnicocalzaturiero.it	info@politecnicocalzaturiero.it	+39 (049) 9801469
Accademia Riaci		X	X		X	X		ITA	www.accademiariaci.info	accademiariaci@accademiariaci.info	+39 (055) 212-791
Training and Production Centre for the Shoe Industry	TPCSI		X		X			KEN		admin@tpcsi.com	+254 20 444 5344
Centro de Investigación y Promoción Educativa y Cultural, A.C.	CIPEC	X			X			MEX	www.cipec.org.mx	cipec@gto1.telmex.net.mx	+52 (477) 774-86-04
Kennis- en Opleidingencentrum	SVGP							NET	www.svgb.nl	info@svgb.nl	+31 30 605 11 20
Leather Products Development Institute	LPDI		X			X	X	PAK	www.lpdi-skt.com	cpinfo@cyber.net.pk	+92 0432 561 139
Osan College - Footwear Department								ROK		mukim@mail.osan-c.ac.kr	+82-339-370-2882
Osan College - Footwear Department		X	X		X			ROK		mukim@mail.osan-c.ac.kr	+82-339-370-2882
Facultatea de Textile Pielărie și Management Industrial	TPMI	X	X		X	X		ROM	www.tuiasi.ro/facultati/tex	decanat@tex.tuiasi.ro	+40 232 230491
Moscow State University of Design and Technology								RUS			
Moscow State Academy of Light Industry								RUS			
International School of Tanning Technology	ISTT	X	X	X				SAF	www.tanschool.co.za	info@tanschool.co.za	+27 086 545 2723
Leather Industries Research Institute - Rhode University	LIRI-RU	X		X				SAF	http://www.ru.ac.za/academic/courses/#science	registrar@ru.ac.za	+27 46 622 65 17
International School of Tanning Technology								SAF	www.tanschool.co.za	info@tanschool.co.za	
Footwear Design and Technology school of South Africa								SAF			+27(0)86667 3339
Escuela Superior de Negocios y Gestión Empresarial de Ámbito Nacional	ESMEIN	X			X	X		SPA	www.csdmm.upm.es	esmein@ctv.es	+34 96 666 38 69
Scuola Universitaria Professionale della Svizzera Italiana	SUPSI	X			X			SWI	www.masfmt.supsi.ch		+41 (0)58 666 66 20
Centre Sectoriel de Formation Techniques Appliquées au Cuir	CSFTAC							TUN		csftac@email.ati.tn	+216 71 433 743

Institution	Abbreviation	Education	Training	Leather	Footwear	Leather goods	Others	Country	Website	E-mail	Fax
Tan-Tech International Consulting	TAN-TECH		X	X				TUN	www.leather-tantech.net	benothman.bechir@wanadoo.tn	+216 72 214077
British School of Leather Technology	BSLT	X	X	X	X	X	X	UK	www2.northampton.ac.uk	bslt@northampton.ac.uk	+44 1604 711 183
De Montford University	DMU	X			X			UK	www.dmu.ac.uk	enquiry@dmu.ac.uk	+44 116 257 7353
Leicester College	LC	X	X		X			UK	www.lec.ac.uk	info@leicestercollege.ac.uk	
Leather Conservation Centre	LCC		X				X	UK	www.leatherconservation.org	lcc@northampton.ac.uk	
Anthony Vrahimis Ltd			X			X		UK	www.anthonivr.com	mail@anthonivr.com	+44 (0)20 7686 0002
Footwear Training Centre - The Wellingborough College		X	X		X			UK	www.tresham.ac.uk	info@tresham.ac.uk	+44 1933441832
Leather Training & Technical Dept. Ltd			X				X	UK	www.ltsolutions.net	enquiries@ltsolutions.net	+44 1423 887324
Leather Wise Ltd.			X	X				UK	www.leatherwise.co.uk	info@leatherwise.co.uk	+44 1604 497 569
State Academy of Light Industry or Enterprises								UKR			380 44 290-16-03
Universidad República, Facultad Ingeniería, Instituto Ingeniería Química	IIQ	X		X				URU	www.fing.edu.uy/iiq/IIQ.html	web_iiq@fing.edu.uy	+598 2 710 7437
Shoeschool.com			X		X			USA	www.shoeschool.com	support@shoeschool.com	+1 360 385 6164

Sequence: by countries

International organizations dealing with leather-based industries

Institution	Abbreviation	Leather	Footwear	Others	Website	E-mail	Fax
African Federation of Leather and Allied Industries	AFLAI	X					
Confédération Européenne de l'Industrie de la Chaussure	CEC		X		www.cecshoe.be	cec@vidac.be	+32 (2) 736 12 76
Confédération des Associations Nationales de Tanneurs et Mégissiers de la Communauté Européenne	COTANCE	X			www.euroleather.com	cotance@euroleather.com	+32 (2) 512 91 57
European Fashion Designer's Association	EFD		X	X		obiemoda@iol.it	+39 (055) 7398935
Eastern and Southern Africa Leather Industries Association	ESALIA	X	X		www.africaleather.com	admin@esalia.org	+254 (20) 4445344
European Union of Research Institutes for Shoes	EURIS		X		www.euris-shoe.org	tgiak@elkede.gr	+30 (210) 2850187
European Union of the Shoemaker-Craft	EVS		X		www.evshoemaker.eu	EVS@EVShoemaker.eu	+49 (2241) 990 100
International Council of Hides, Skins and Leather Traders Association	ICHSLTA	X			www.ichslta.org	wp@chinaleather.org	+44 (1896) 82 3344
International Labour Organization	ILO			X	www.ilo.org	ilo@ilo.org	+41 (0) 22 798 8685
International Trade Centre	ITC	X	X		www.intracen.org	itcreg@intracen.org	+41 (22) 733 4439
International Council of Tanners	ITC	X			www.tannerscouncilct.org	sec@tannerscouncilct.org	+44 (1604) 679998
International Union of Leather Technologists and Chemists Society	UILTCS	X			www.iultcs.org	office@iultcs.org	44 (1604) 711183
Union Internationale des Techniciens de l'Industrie de la Chaussure	UITIC		X		www.uitic.org	uitic@uitic.org	+34 (6) 538 10 45
United Nations Development Programme	UNDP			X	www.undp.org		+1 (212) 906-5001
United Nations Industrial Development Organization	UNIDO	X	X	X	www.unido.org	I.Kral@unido.org	+43 (1) 26026 6849

Sequence: by abbreviations



TRAINING CONTENTS

These are some professional training courses designed for and successfully used in the leather products industry. The objective is not to provide ready solutions, rather to demonstrate typical contents and approaches.

Skill Development

Those completing the 1-3 year traditional vocational/apprentices education normally have profound knowledge of the entire technological process (including materials, tools and equipment and quality implications), acquire skills required to perform all (including key) operations and can make complete products. Their qualification is “skilled worker” capable of producing given products. All these are well tuned to the needs of micro- and small-scale plants relying on manual processes. In modern factories operators are stuck to specific machines and jobs, they should be fast enough (to meet time standards and earn reasonably), whereas their knowledge and skills in other operations remain unutilized. To resolve this contradiction, workers performing complex and responsible operations may be trained only to that kind of job within much shorter time, while simpler operations may be learned on the job. In leather products manufacturing there are two such operations: genuine leather cutting and shoe upper or leather goods stitching. Respective **analytical training** methods are described in *Annex 4.2* and *4.3*.

Analytical training is organized in specifically equipped training workshops in groups of 6-10 trainees/instructor. Time required for green labour training is 12-16 weeks full time (35-40 h/week). Instructors (from experienced cutters and sewing machinists) may be trained in 3-4 weeks full time (35-40 h/week). Probably several retraining sessions will be required for upgrading cutters (e.g. in different kind of materials and products) and stitchers (e.g. in different constructions and styles) – each of them would need 2-5 working days (14-40 h). Analytical retraining may be required for improving productivity and quality of work done by existing operators (having bad habits preventing better performance).

Special training courses or procedures with duration of 1-5 working days may be used for operations requiring semi-skilled workers (e.g. skiving, edge binding, heel-seat lasting, sole attaching).

Technical Management Training

Short term upgrading training (courses) may be organized with the following features and conditions:

- *Entry requirement:* Minimum basic education (8th grade) or equivalent, min. 22 years age. Two years practical experience in footwear design, production or trade.
- *Duration:* 1-4 weeks full time or 2-10 weeks part time (evening or weekend), 30 hours/week or 15 hours/week respectively.
- *Certificate:* Certificate of attendance (no exam) or successful completion of the course (with examination).

- *Target jobs:* Specialized tasks in product development, shoe manufacturing or management.
- *Type of induction:* ~70% theory, ~30% case studies and/or project work.

Examples of typical training contents are as follows:

- **Actual fashion trends:** clothing and apparel, colors, shoe lasts and shapes, materials, cuts, soles and heels, decorations, combinations with other leather accessories.
- **Computer-Aided Design (CAD):** sketching and painting, preparation and digitizing of shells, component construction, allowances, grading, pattern cutting, 2D and 3D systems.
- **Technology upgrade:** new materials, constructions, processes, equipment, automation, production control methods and computer software in footwear manufacture.
- **Production management:** modern technology and its application, range building and marketing, time and motion studies, industrial engineering (ergonomics), planning and scheduling, controlling and reporting, motivation and incentives, communication.
- **Quality assurance:** standards, test methods, in-plant and final inspection, quality requirements, certification and accreditation, ISO 9000, total quality management (TQM), quality assurance.
- **Marketing:** consumer behaviour, market research and segmentation, collection and interpretation of fashion information, product life cycle, range building and product development, channelling, promotion, branding, costing, pricing policies and practices, consumer services, export and import regulations.
- **Maintenance:** inspections, small and medium repairs, overhauling, troubleshooting, preventive maintenance systems, spare-part management, special aspects of maintaining equipment groups (die cutting, sewing, component manufacturing, lasting, injection moulding), die making, tooling.
- **Instructor training:** structure of human skills, why and how people learn, skill analysis, inductions, demonstration, feed-back, stamina building.
- **Entrepreneurship:** opportunity and feasibility studies, business planning, legal aspects, financing, promotion and public relations, industrial cooperation.

More elaborated training contents are given as examples in *Annex 4.4*.

ANALYTICAL TRAINING OF GENUINE LEATHER CUTTERS

The **analytical** (or **skill analysis**) **training** is based on the thorough analysis of working methods used by the *experienced* operators. The shoe upper cutting training system and methodology, including accessories and auxiliary equipment, training aids and manual, was developed and being offered by TECHNORG CONSULTING in Hungary.

The Objective

The main objective of the analytical training is to *achieve the experienced workers standard* – in terms of quantity (productivity) and quality – within the shortest possible time. A great deal of the system is used for training of *instructors*, while its other modules are applicable for *retraining* operators not achieving the required targets or those transferred for production of entirely different products.

Target Audience

Green labour recruited for (new, extended, rehabilitated or relocated) footwear manufacturing plants is the target beneficiaries of the analytical training. They can be trained to the basics of genuine leather and (or) its substitutes cutting by instructors acquiring the necessary knowledge and applying the systematic approach of the analytical training method. Direct labour exposed to new tasks (e.g. production of higher quality footwear, introduction of new materials, transfer from lining to upper leather cutting) or having bad habits which prevents them increasing their output, could also be subjects of the analytical training.

The analytical training **does not intend** to replace the vocational or higher level training of specialists employed in shoe factories. It or its certain elements may, however, be utilized in the practical training of supervisors, plant managers, technologists as well.

The Problem

Cutting (especially genuine soft leather) needs a *combination of various mental and manual skills*. The job is too complex to be taught as the operator's attention is divided among a number of factors having direct impact on the material utilization, thus on production costs. The cutter should realize the quality of the leather (its substance, strength, shade, topography, faults etc.), has to assess the suitability of its each portion for certain components, should be able to place the pattern or cutting die in position giving minimum waste but still assuring the right orientation of the component as to its stretch properties, has to take quick decisions in order to achieve the required productivity. Furthermore she/he has to possess all the manual skills needed for setting and operating the die clicking machine, using and maintaining the hand cutting knife. To learn all these skills normally needs years of experience. The best workers have certain “secrets” which they may not really be aware of or would not (be able to) transfer the hints to a trainee.

The Principle

The (leather) cutting operation, like any other job, can be broken into *knowledge elements* and into a *set of skills*. There are certain basic skills which may be developed separately helping the trainee to concentrate on those particular aspects of the operation. The combination of these basic skills may also be done on a step-by-step basis offering again an efficient way of enhancing the trainees' capabilities (the enclosed chart demonstrates the system of skills and the principle of their

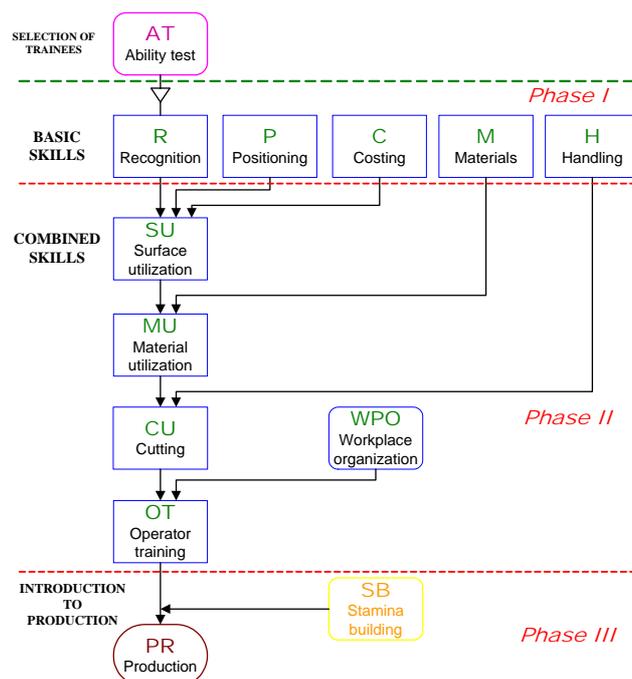
combination). All these are done through dozens of specially designed exercises which have to be done by each trainee at target times and quality requirements. The actual results are registered in score sheets. The progress made by individual trainees is thoroughly monitored (by the instructor) and introduction of new skill elements is the subject of achieved results. This approach makes it possible that the trainees proceed to more complex exercises only when they have acquired perfection in carrying out simpler tasks. Each exercise is measured, so appropriate feedback is provided for both the instructor and the trainee. Above all most of the skill development is done in **practice** without wasting *any* genuine leather or other valuable material.

In case of cutters and clickers the **personal abilities** are very important factors: the eyesight, the visual combination, pattern recognition, touch play key role in performing this complex operation. In order to assess these (partly inherited) skills a set of **psychological and manual tests** are supplied together with the analytical training system, which help to appraise candidates for the job and provide valuable tools in selection of trainees.

The analytical training philosophy is based on the fact that *everybody has skills* which could be developed to the required level if appropriate procedures are used.

Exercises to Develop Skills

There are five basic and four combined skills to be developed through the analytic training process. Beside the set of respective exercises the trainees should learn how to organize their work-places and how to develop their stamina required for the continuous production work (see the chart below). The objective and contents of the **basic skill development** modules are as follows:



RECOGNITION: Combination of surface elements, putting together shapes from its parts, determine size and proportion of different shapes.

POSITIONING: Find shapes (shoe components) fitting into given area without and with combining different pieces, without and with repeating the same piece.

COSTING: Estimating and measuring net pattern area, building parallelograms, calculation of first and side wastes, determination of wastes because of material faults, computation of allowances.

- MATERIALS:** Appreciation of different kinds of materials used for shoe uppers and lining, recognition of hides and skins of different origin, appreciation of surface finishes, distinction between various faults, strengths and thicknesses, leather grading.
- HANDLING:** Use and sharpening of hand cutting knives, setting clicking presses, types of clicking dies and blocks.
- When manual and mental basic skills have been developed, trainees proceed to the **combination** of them, adding one or two elements at a time:
- SURFACE**
- UTILIZATION:** Placement one and later more, simple and complex shoe components of one and different sizes on a given area of.
- MATERIAL**
- UTILIZATION:** Preparation of cutting layouts for leather substitutes (textile, simulated leather) and genuine leather using different techniques.
- OPERATOR**
- TRAINING:** Manual and die cutting of paper having a shape of materials used for footwear uppers and lining.
- WORK-PLACE**
- ORGANIZATION:** Placement of materials, cutting dies and cut components, cleaning the work area and waste management, lighting, recording work results.
- STAMINA**
- BUILDING:** Gradual development of workers attitude, stamina for continuous work.
- After the trainee has successfully gone through all related exercises and learned all theoretical lessons she/he is transferred for to **production** work.

The Knowledge Base

Beside the acquired manual skills cutters should know about *materials* (their nature, topography, physical properties, look, surface characteristics), *equipment* (cutting knives and dies, principles of machine operation, blocks and their maintenance), *quality requirements* with special references to fault analysis, shoe component preparation *technology*. The background knowledge consists of two parts. The **technology related knowledge** includes shoe types, component denomination, tools and machines used in footwear manufacture, main phases of the process technology, the structure of a shoe factory etc. The **general knowledge** of a cutter or clicker should cover work safety, wage systems (including bonuses), work discipline measures, training opportunities etc.

Instructors are introduced to such skills and information as selection of trainees, job analysis and preparation of appropriate exercises, target times and quality requirements, progress control, scheduling of trainees activities and optimal utilization of resources (equipment), role of instructors, demonstration and illustration techniques, use of audio-visual aids, how to give theoretical lessons, transferring trainees to production, dealing with young trainees.

Special Features

The analytical training has a number of features which distinguishes it from the traditional methods and which makes it more efficient in case of green labour training as well as in retraining of experienced operators. These are

- a **systematic approach** which starts from the personal ability test, develops basic skills and then combines them into a comprehensive manual and mental potential;
- skills are developed through *exercises* with target times and quality requirements providing feedback and reliable data for progress control;
- the pace trainees advance in acquiring skills is individual and adjusted to personal abilities;

- theoretical lessons are limited to two times half an hour daily and concentrating on the relevant knowledge element, hence providing sufficient background information required for a cutter to become a member of the factory team;
- the training process is supported by a wide range of special exercises, auxiliary equipment, slides and *demonstration materials*;
- several exercises are done by using *computer programs* providing objectiveness and versatility;
- the training process consumes very little of valuable materials making the analytical training *cost effective*;
- instructors trained to the use of analytical training will be able not only to adapt the system to local conditions but also to develop special exercises serving particular purposes;
- the analytical training method can be used in shoe factories, as well as in training and development institutions, at the same time it is a useful component in educating middle managerial staff and technologists.

ANALYTICAL TRAINING OF SEWING MACHINISTS AND INSTRUCTORS

The sewing machinists (operators) training method based on skill analysis was introduced in the apparel manufacturing units in England several decades ago. Leading companies like CLARK and institutes such as SATRA adopted the system, modified it for the specific needs of the shoe industry and have been using for training operators and instructors practically until today. This analytical approach proved to be extremely efficient and assisted production managers to implement standard working methods providing high productivity *together* with good quality of workmanship. As a consequence the system has been introduced almost everywhere in Europe, North America and Australia. UNIDO has also realized the efficiency of the analytical training and implemented it successfully in several developing countries.

The Objective

The main objective of the analytical training is to *achieve the experienced workers standard* – in terms of quantity (productivity) and quality – within the shortest possible time. The system has special facilities to be used for training of *instructors*, hence other modules are applicable for *re-training* operators not achieving the required targets or those transferred for production of entirely different products.

The Complexity of Sewing

Sewing of shoe uppers needs refined manual skills, concentrated attention, coordination of senses and motions and quick reactions. But first of all operators should be able to guide upper components under the roller presser of high speed industrial sewing machines with *high confidence* regulating the speed by a treadle which controls the clutch motor (today's sophisticated machines have maximum speed as high as 5,000 stitches/min). At the same time the machinist's attention is focused to the rather small work zone and the guidance have to be done by very precise movements of both hands. Besides controlling the machine the operator should be prepared to change needle or bobbins, (re)thread the machine, should be able to handle the scissor, pick up and place shoe upper components, change stitch length etc.

The major difference between stitching fabrics and leather is that errors made on the latter **cannot** be repaired and the expensive genuine material used for that particular component(s) becomes wastes. This fact puts a high degree of responsibility on the operator which in turn may prevent him/her selecting the right (higher) speed and thus the required productivity. If an operator runs the sewing machine too slow then – because (s)he concentrates on the needle rather than on the presser wheel/foot – the quality (evenness) of the stitch is normally below the required standard. In other words productivity **and** quality are directly related in the closing room technology, so the operations should be taught at the right speed from the very beginning, i.e. traditional self or imitation training methods do not bring about the required results the trainees need too long time to achieve the *experienced operator's standard*.

To learn all these skills normally needs long years of experience. The best workers have certain “secrets” which they may not really be aware of or would not (be able to) transfer the hints to a trainee.

Green labour recruited for (new, extended, rehabilitated or relocated) footwear manufacturing plants are the target beneficiaries of the analytical training. They can be trained to one or a few basic operations to carried out on the same (flat, post or cylinder bed) sewing machine by instruc-

tors acquiring the necessary knowledge and applying the systematic approach of the analytical training method. Direct labour exposed to new tasks (e.g. production of higher quality footwear, introduction of new materials, transfer from simpler to more complicated operations) or having bad habits which prevents them increasing their output, could also be subjects of the analytical training. The analytical training **does not intend** to replace the vocational or higher level training of specialists employed in shoe factories. It or its certain elements may, however, be utilized in the practical training of supervisors, plant managers, technologists as well.

The Principle

Sewing operations can be broken into *knowledge elements* and into a *set of (manual) skills*. There are certain basic skills which may be developed separately helping the trainee to concentrate on those particular aspects of the operation. The combination of these basic skills may also be done on a step-by-step basis offering again an efficient way of enhancing the trainees' capabilities (the enclosed chart demonstrates the system of skills and the principle of their combination). All these are done through about 70 specially designed exercises which have to be done by each trainee at target times and quality requirements, whereby even the number of consecutive attempts made with success. The actual results are registered in score sheets. The progress made by individual trainees is thoroughly monitored (by the instructor) and introduction of new skill elements is the subject of achieved results. This approach makes it possible that the trainees proceed to more complex exercises only when they have acquired perfection in carrying out simpler tasks. Each exercise is measured, so appropriate feedback is provided for both the instructor and the trainee. Above all most of the skill development is done in **practice** without wasting *any* valuable material. For certain exercises special but very simple equipment simulating the parts of sewing machines are used so the expensive sewing machines are not blocked by the beginners.

Depending on the progress made the trainees can be selected for operations requiring more skills or they may be advised to take other jobs in closing rooms.

The analytical training philosophy is based on the fact that *everybody has skills* which could be developed to the required level if appropriate procedures are used.

The Structure of Analytical Training of Sewing Machinists

There are four basic and three combined skills to be developed through the analytic training process. Beside the set of respective exercises the trainees should learn how to organize their workplaces and how to develop their stamina required for the continuous production work (see the chart overleaf).

The objective and contents of the **basic skill development** modules of the analytical training system are as follows:

POSITIONING: Place correctly components, uppers and tools on the work bench, pick up components and position them under the roller presser, remove and place on the bench or in a box with minimum movements and time. All these skills are practiced by using training devices.

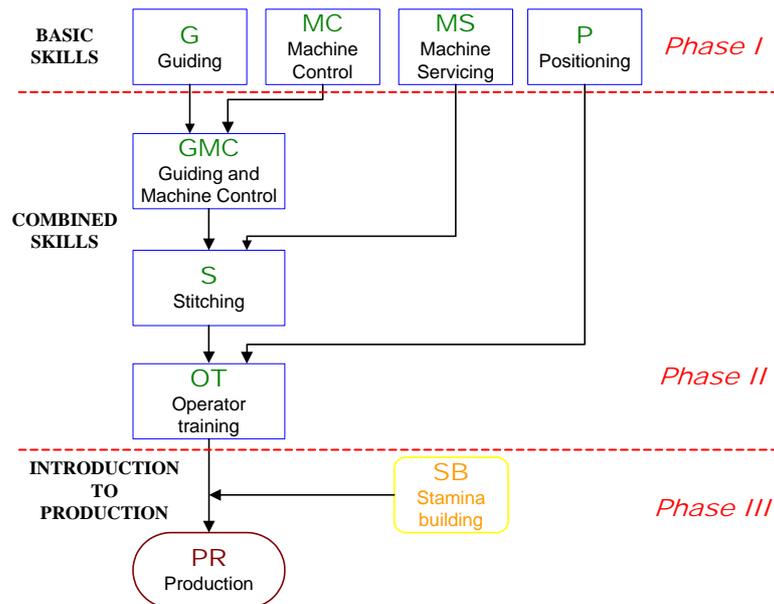
MACHINE

SERVICING: Change needle and bobbins, (re)thread the machine under the shortest period of time. All these skills are practiced by using training devices.

MACHINE

CONTROL: Select the appropriate stitching speed keeping it constant or changing it according to the needs, lift or lower the needle, make exact number of stitches - using only the treadle of the clutch motor (without having thread in the machine).

GUIDING: Guide components, shoe uppers under the presser wheel at constant and gradually increasing speed following simple, then more and more complicated curves (without needle and thread in the sewing machine).



When *all* these basic (manual) skills have been developed, i.e. trainees achieved the required standards in terms of speed *and* quality, they proceed to the **combination** if them adding one element at a time:

GUIDING AND MACHINE CONTROL:

Following straight, curved and combined lines printed on bonded fibre having only needle but no thread in the sewing machine.

STITCHING: Stitching various complexity of lines marked on the surface of genuine or synthetic leather, including cutting thread after each piece is completed.

OPERATOR TRAINING:

Sewing together pieces of leather, cutting off, placing into a box (i.e. imitation of real operations of upper making). Performing simple (e.g. back seam) and more sophisticated (e.g. assembling) operations on real shoe uppers.

STAMINA BUILDING:

Gradual development of workers attitude, stamina for continuous work.

After the trainee has successfully gone through all related exercises and learned all theoretical lessons she/he is transferred for to **production** work.

Beside the acquired manual skills cutters should know about *materials* (upper and lining leather, textile, reinforcements, threads – their nature, physical properties, numbering), *equipment* (different sewing machines, needles, scissors and their maintenance), *quality requirements* with special references to fault analysis, shoe component preparation *technology*. The background knowledge consists of two parts. The **technology related knowledge** includes shoe types, component denomination, main phases of the process technology, the structure of a shoe factory etc. The **general knowledge** of a cutter or clicker should cover work safety, wage systems (including bonuses), work discipline measures, (re)training opportunities etc.

Instructors are introduced to such skills and information as selection of trainees, job analysis and preparation of appropriate exercises, target times and quality requirements, progress control, scheduling of trainees activities and optimal utilization of resources (equipment), role of instructors, demonstration and illustration techniques, use of audio-visual aids, how to give theoretical lessons, transferring trainees to production, dealing with young trainees.

Special Features

The analytical training has a number of features which distinguishes it from the traditional methods and which makes it more efficient in case of green labour training as well as in retraining of experienced operators. These are

- the **systematic approach** which first develops basic skills and then combines them into a comprehensive manual potential;
- skills are developed through *exercises* with target times and quality requirements providing feedback and reliable data for progress control;
- the pace trainees advance in acquiring skills is individual and adjusted to personal abilities, whereby the trainee is exposed to more complicated jobs only when all the necessary basic (composite) skills have already been acquired at the required standard;
- theoretical lessons are limited to two times half an hour daily and concentrating on the relevant knowledge element, hence providing sufficient background information required for a cutter to become a member of the factory team;
- the training process is supported by a wide range of special exercises, auxiliary equipment, slides and *demonstration materials*;
- the training process consumes very little of valuable materials making the analytical training *cost effective*;
- instructors trained to the use of analytical training will be able not only to adapt the system to local conditions but also to develop special exercises serving particular purposes;
- the analytical training method can be used in shoe factories, as well as in training and development institutions, at the same time it is a useful component in educating middle managerial staff and technologists.

Prerequisites and Conditions

The analytical training method gives the best results if the following conditions are provided and maintained:

- qualified *instructors* supervise the training process (in case of small number of trainees the plant or unit supervisor may perform the role of the instructor);
- not more than 6-8 trainees are assigned to one instructor in direct labour training or 8-12 skilled operators in instructor's training;
- the special *equipment, machines, materials and audio-visual aids* listed in the enclosed table are available.

TRAINING CONTENT EXAMPLES

Footwear Design

Subject: shoe design (sketching, range building), range building, pattern engineering and size grading, documentation, material costing.

Participants: designers/pattern makers of shoe manufacturing companies: 6-12/group.

Duration: basic module (foot anatomy and measurements, shoe lasts and its shell) – 30 hours
fashion concepts, aesthetic design/sketching – 30 hours
range building, marketing aspects, costing – 30 hours
upper constructions – 120 hours
special shoe constructions (safety, athletic, boots, moccasin etc.) – 60 hours
component construction – 30 hours
pattern grading – 30 hours
use of CAD systems (2D) – 60 hours.

Timing: evenings (4 hour/day), weekends (8 hours/day) or full time.

Infrastructure: classroom with 12 large tables and audio-visual equipment, cutting blocks, knives, drawing tools and accessories (for each trainee), shoe lasts, shoe components, cardboard (for patterns) furniture (teacher's desk, shelves, cupboards etc.) and audio-visual aids.

Leather products marketing

Subject: special and practical aspects of leather, footwear, leather goods and leather garment marketing (leading manufacturers and exporters, fashion information sources, market research, material and component procurement, range building and product development, costing and pricing, niche marketing and promotion, channeling, branding etc.).

Participants: procurement and sales officers, middle managers, agents, company owners.

Duration: 35-40 hours.

Timing: evenings (4 hours/day), weekends (8 hours/day).

Infrastructure: classroom with audio-visual aids, fashion magazines and trends, samples (shoes, lasts, components, material, accessories etc.).

Reference: FLISC/Egypt.

Production supervision

Subject: technical and managerial aspects of production control (materials and environmental protection, quality systems and assurance, product development and production preparation, modern technology and process automation, OSH, marketing and logistics, industrial engineering, cost control, analytical labour training methods and systems, production and personnel management, wage systems etc.).

Participants: line and plant supervisors, technical managerial staff of shoe, leather goods and garment factories (tannery technicians and plant supervisors may also participate, but the technology related subjects may be thought separately or individually).

Duration: 70 hours.

Timing: evenings (4 hours/day), weekends (7 hours/day).

Infrastructure: classroom with audio-visual aids, visits to practical training facilities and retail shops.