

International Handbook of Education for the Changing World of Work

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International Handbook of Education for the Changing World of Work

Bridging Academic and Vocational Learning



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Dedication to David N. Wilson

This **International Handbook of Education for the Changing World of Work** is dedicated to Professor David N. Wilson. David Wilson contributed significantly to the development of this handbook, from the planning stages and the process of identifying contributors, through to the assembly of completed chapters into a prototype. It is very unfortunate that David did not live long enough to see the final product of his hard and cherished labour. However, he will be remembered for his leadership role and the important intellectual guidance he provided to this project.

David Wilson was an outstanding teacher and a world-class scholar in the field of development education. He has trained and mentored many graduate students who are playing key leadership roles in development education throughout the world, be they policy-makers, researchers or practitioners. As a researcher, David has contributed substantially to furthering our understanding of the field of comparative education and of development education, particularly as it relates to education for the world of work. His prolific scholarly contribution is a legacy left behind as a testimony of his commitment and dedication to his profession and to the advancement of knowledge and of humanity. David was firmly committed throughout his life to international development and, as such, was very keen to use education as leverage to improve human conditions with regard to poverty alleviation, improved equity and justice, especially in developing countries.

Those who have worked with David over the years will unanimously agree that he was not only a good collaborator, but also a good friend. David will be missed a great deal, but his memory and sphere of influence will live on through his students and through the legacy of his extensive range of scholarly works.

Preface

The idea of developing and publishing an ‘International Handbook of Education for the Changing World of Work: Bridging Academic and Vocational Learning’ goes back to discussions between myself and David Wilson as early as 2001.¹ We commenced work immediately; nevertheless, it has taken some seven years to bring the Handbook to full fruition.

Readers will not be surprised by the time it has taken to complete this project, since this has been a mammoth, complex undertaking, involving some 218 authors, 197 chapters and a manuscript of 1.2 million words, which is now published in six volumes. This *Handbook* is the first of its kind, bringing together leading educational researchers, policy-makers and practitioners from all parts of the world; and from developed and developing countries. At every stage the aim has been to develop chapters of the highest quality. Thus, the matter of quality assurance has been at the forefront of our minds throughout the project. I hope that all who read this *Handbook* will agree that the considerable time and effort involved has been more than worth the trouble.

In 1991, the World Bank published a policy paper written by John Middleton, Adrian Zideman and Arvil Van Adams. This was widely interpreted (and also widely misinterpreted) to say that school-based technical education was not a sound investment. The consequences wrought by this policy paper had a strong impact on TVET, earning the authors a reputation going well beyond their intentions. In a gesture to redress this involuntary milestone, we invited one of these authors, Arvil Van Adams, to write a prologue to this *International Handbook* on a subject of his own choosing. He decided to discuss the non-governmental delivery of TVET in Sub-Saharan Africa.

On behalf of the editors, I wish to acknowledge the contributions of the many individuals who have worked so hard through all the different stages to bring this *Handbook* to successful completion. Thanks are conveyed to all the authors for their commitment to this project and for their well-conceived, scholarly contributions. Recognition is also due to the section editors for helping to co-ordinate the work of the authors and, most importantly, for their efforts to ensure content validity and the high quality of chapters.

Secretarial and editorial work by staff in the UNESCO–UNEVOC International Centre for Technical and Vocational Education, in Bonn, Germany, under the able

leadership of the Head of Publications, Ms Natalia Matveeva, with assistance from Joachim Lapp, was also an essential contribution to the successful completion of this *Handbook*. Ms Matveeva's work was subsequently taken over and brought to a successful conclusion by Ms Alix Wurdak.

Special thanks are due to Associate Editor Professor Chris Chinien, who agreed at short notice to become a joint editor of the Handbook, and so enabled its successful completion after the untimely death of General Co-editor, David Wilson, in October 2006. In addition to being a Section Editor and the author of several chapters in the handbook, Chris made a substantial contribution to finalizing the content and structure of the whole Handbook, especially with regard to quality assurance.

Special thanks also to John Fox for desk editing the entire manuscript so professionally, thoroughly and in a timely way.

Finally, we would like to thank Harmen van Paradijs and Marianna Pascale of the publishers Springer for the considerable care with which they have assisted and guided this project throughout the lengthy period of gestation.

UNESCO-UNEVOC, Bonn
Germany

Rupert Maclean

Note

1. This *Handbook* is part of the larger 'UNESCO-UNEVOC International Library of Technical and Vocational Education and Training', which consists of two Handbooks, a book series and various other publications. Full details are provided on the following pages.

UNESCO-UNEVOC International Library of Technical and Vocational Education and Training

International Library of Technical and Vocational Education and Training

Work is a major feature in most people's lives. Not only does it provide them with the means to meet basic needs, such as food, clothing and shelter, but also the type of work undertaken by individuals and groups has a major impact on their self-identity, social status and standard of living. Technical and vocational education and training (TVET) is concerned with the acquisition of knowledge and skills for the world of work to increase opportunities for productive work, sustainable livelihoods, personal empowerment and socio-economic development.

The UNEVOC International Library of Technical and Vocational Education and Training is a series of publications that provide comprehensive information about many cutting-edge aspects of TVET. The Library showcases best practices and innovative approaches to skills development for employability and seeks to create an effective bridge between research, policy and practice. It is an on-going project and publications prepared as part of the Library complement each other. Elements of the Library are:

- UNESCO-UNEVOC International Handbook of Education for the Changing World of Work: Bridging Academic and Vocational Learning;
- International Handbook of Technical and Vocational Education and Training Research;
- UNESCO-UNEVOC Book Series 'Technical and Vocational Education and Training: Issues, Concerns and Prospects';
- UNESCO-UNEVOC Discussion Papers;
- UNESCO-UNEVOC Annotated Bibliographies of Technical and Vocational Education and Training;
- UNESCO-UNEVOC Case Studies of Technical and Vocational Education and Training in Selected Countries.

Most of these publications are published by Springer Science and Business Media, and some others by UNESCO-UNEVOC itself. The audience for the publications in the Library includes policy-makers, practitioners, administrators, planners, researchers, teachers, teacher educators and students, as well as colleagues in other fields interested in learning about education for the world of work and TVET in developed and developing countries, countries in transition and countries in post-conflict situations.

UNESCO-UNEVOC International Handbook of Education for the Changing World of Work: Bridging Academic and Vocational Learning

General Editors: Rupert Maclean and David N. Wilson

Associate Editor: Chris Chinien

Springer — (2009)

English

The UNESCO-UNEVOC International Handbook of Education for the Changing World of Work is the first reference tool of its kind. It provides a comprehensive coverage of cutting-edge developments in research, policy and practice in TVET within a single source and aims to assist those involved in TVET at any level in making informed decisions and to further advance and improve the field.

The six volumes and nearly 200 chapters of the Handbook cover such topics as: TVET policy and reform; financing TVET systems; TVET teacher education; assessment in TVET; TVET research and curriculum development; participation in formal TVET programmes; regional TVET profiles; information and communication technologies in TVET; TVET for youth and in ageing societies; TVET in informal economies and in countries in post-conflict situations.

Some 220 TVET experts explore the prospects and challenges in each of these areas from diverse perspectives. The authors are from developing and developed countries, UN agencies, universities, national and international research centres, leading training institutions, national and international statistical offices and ministries of education.

Order the International Handbook of Education for the Changing World of Work: Bridging Academic and Vocational Learning from: <http://www.springer.com/education>

UNESCO-UNEVOC Book Series ‘Technical and Vocational Education and Training: Issues, Concerns and Prospects’

Series Editor: Rupert Maclean

Publisher: Springer

English

While the International Handbook of Education for the Changing World of Work provides a survey of the field, the Book Series explores selected aspects of TVET in depth and focuses on topics that require a more detailed analysis. The series closely follows new developments and innovations in TVET and showcases these. It presents best and innovative practices, explores controversial issues and uses case studies as examples.

Topics covered in the Book Series include: the vocationalization of secondary education; international perspectives on teachers and learners in TVET; TVET for sustainable development; TVET in the informal sector; the transformation of TVET

in transition economies; how changing work situations form personal identities; understanding learning for and throughout working life; TVET as a factor of life-long learning; vocational content in mass higher education; self-directed learning in TVET; modern apprenticeships and qualifications research.

Titles published to date (as of February 2009) are:

- Vocationalisation of Secondary Education Revisited, by Jon Lauglo and Rupert Maclean (eds.), 2005.
- Meeting Basic Learning Needs in the Informal Sector: Integrating Education and Training for Decent Work, Empowerment and Citizenship, by Madhu Singh (ed.), 2005.
- Training for Work in the Informal Micro-enterprise Sector: Fresh Evidence from Sub-Saharan Africa, by Hans Christian Haan, 2006.
- The Transformation of Vocational Education and Training (VET) in the Baltic States: Survey of Reforms and Developments, by Frank Bünning, 2006.
- Work, Subjectivity and Learning: Understanding Learning through Working Life, by Stephen Billett, Tara Fenwick and Margaret Somerville (eds.), 2006
- Identities at Work, by Alan Brown, Simone Kirpal and Felix Rauner (eds.), 2007.
- International Perspectives on Teachers and Trainers in Technical and Vocational Education, by Philipp Grollmann and Felix Rauner (eds.), 2007.
- Work, Learning and Sustainable Development, by John Fien, Rupert Maclean and Man-Gon Park (eds.), 2009.
- Rethinking Work and Learning: Adult and Vocational Education for Social Sustainability, by Peter Willis, Stephen McKenzie und Roger Harris (eds.), 2009.
- Technology and Vocational Education for Sustainable Development: Empowering Individuals for the Future, by Margarita Pavlova, 2009.

Order publications in the UNEVOC Book Series 'Technical and Vocational Education and Training: Issues, Concerns and Prospects' from: <http://www.springer.com/series/6969>

Handbook of Technical and Vocational Education and Training Research

Editors: Felix Rauner and Rupert Maclean

Springer — (2008)

English

Technical and vocational education and training (TVET) research has become a recognized and well-defined area of interdisciplinary research. This is the first handbook of its kind that specifically concentrates on research and research methods in TVET.

The book's sections focus on particular aspects of the field, starting with a presentation of the genesis of TVET research. They further feature research in relation to policy, planning and practice. Various areas of TVET research are covered, including on the vocational disciplines and on TVET systems. Case studies illustrate

different approaches to TVET research, and the final section of the book presents research methods, including interview and observation methods, as well as of experimentation and development.

This handbook provides a comprehensive coverage of TVET research in an international context, and, with special focus on research and research methods, it is a cutting-edge resource and reference.

Order the Handbook of Technical and Vocational Education and Training Research from: <http://www.springer.com/education>

UNESCO-UNEVOC Annotated Bibliographies of Technical and Vocational Education and Training

Editor: Natalia Matveeva

Published by UNESCO-UNEVOC

English

The UNESCO-UNEVOC Annotated Bibliographies of Technical and Vocational Education and Training are a series of literature reviews on key issues in TVET that provide information about the latest developments, current innovations and best practices. The Bibliographies reflect the range of currently available literature, such as articles, books, government reports, documents of UN agencies and donor communities, research theses and other sources available on the Internet. They provide bibliographical aid to policy makers, researchers and practitioners in TVET.

Titles published to date in print and electronic format:

- TVET for Sustainable Development, 2004.
- Women and TVET, 2004.
- Youth Unemployment: Meeting the Needs of Youth, 2004.
- Exploitative Work: Child Labour, 2004.
- Occupational Health and Safety, 2004.

Access or order the UNEVOC Annotated Bibliographies of Technical and Vocational Education and Training free of charge from: <http://www.unevoc.unesco.org/publications>

UNESCO-UNEVOC Discussion Papers

Editors: Rupert Maclean and Natalia Matveeva

Published by UNESCO-UNEVOC

English (some titles are available in other languages)

The Discussion Papers facilitate the dissemination of crucial research and innovative ideas in technical and vocational education and training (TVET). They are shorter documents that aim to stimulate debate about TVET issues and promote the field. The topics covered in the Discussion Papers range from orienting TVET

for sustainable development to establishing national qualifications systems and analysing statistical data on access to formal TVET worldwide.

Most of these Discussion Papers are published by UNESCO-UNEVOC in collaboration with partner institutions. Titles published to date in print and/or electronic format include:

- Orienting TVET for Sustainable Development, 2006.
- The Development of a National System of Vocational Qualifications (in co-operation with the Scottish Qualifications Authority), 2006.
- The 6Es Plus Education Makes Seven: Why Is Education Central to the Youth Employment Summit (YES) Campaign?, 2006.
- Research for TVET Policy Development, by Jon Lauglo (in co-operation with InWent — Capacity Building International), 2006.
- The Bologna Declaration and Emerging Models of TVET Teacher Training in Germany, by Frank Bünning and Alison Shilela (in co-operation with InWent — Capacity Building International), 2006.
- Participation in Formal TVET Programmes Worldwide: An Initial Statistical Study (in co-operation with the UNESCO Institute for Statistics), 2006.
- Approaches to Action Learning in Technical and Vocational Education and Training, by Frank Bünning (in co-operation with InWent — Capacity Building International), 2007.
- Education for Livelihoods and Civic Participation in Post-conflict Countries: Conceptualizing a Holistic Approach to TVET Planning and Programming in Sub-Saharan Africa, 2007.
- Why Do German Companies Invest in Apprenticeships? by Klaus Schaack, 2008.
- The Changing Status of Vocational Higher Education in Contemporary Japan and South Korea, by Roger Goodman, Sachi Hatakenaka and Terri Kim, 2009.
- Why Is Skills Development for Work/Employability Essential if EFA and the Dakar Framework for Action Are to Be Achieved? (in press).

Access or order UNEVOC Discussion Papers free of charge from: <http://www.unevoc.unesco.org/publications>

UNESCO-UNEVOC Case Studies of TVET in Selected Countries

Editor: Efison Munjanganja

Published by UNESCO-UNEVOC

English

The Case Studies of TVET in Selected Countries provide in-depth information on issues of specific importance in the TVET systems of selected countries and regions. An initial collection of case studies from Sub-Saharan Africa and South-East Asia is in preparation.

- Revitalizing a Technical Training Institute in Kenya. A Case Study of Kaiboi Technical Training Institute, Eldoret, Kenya, by John W. Simiyu, 2009.

Access or order UNEVOC Case Studies free of charge from: <http://www.unevoc.unesco.org/publications>

Other UNESCO-UNEVOC Publications

In addition to the publications that form the **UNESCO-UNEVOC International Library of Technical and Vocational Education and Training**, UNESCO-UNEVOC also publishes stand-alone publications both on its own behalf and jointly with other organizations. These include newsletter, books, reports and brochures on key TVET issues.

Newsletter (Bulletin/Forum)

Editors: Maja Zarini and Natalia Matveeva

The UNESCO-UNEVOC Bulletin is the newsletter of the UNESCO-UNEVOC International Centre. It informs TVET experts about the activities of UNESCO-UNEVOC, UNEVOC Network members and other agencies engaged in TVET. It is the only international newsletter that brings together the major international agencies involved in TVET in order to report on their activities.

The Bulletin contains a supplement called UNEVOC Forum. The Forum is distributed with the Bulletin, but is also available separately and on the web. Researchers, policy-makers and practitioners from around the world are invited to contribute their views in the form of a long article on a key issue, concern or proposal regarding TVET. Both the Bulletin and Forum are available in print as well as in digital format and are distributed to about 2,600 individual/institutional recipients.

The UNESCO-UNEVOC Bulletin and the UNEVOC Forum are published several times each year. Both are published in Arabic, Chinese, English, French, Portuguese, Russian and Spanish.

Access or order the Bulletin and Forum free of charge from: <http://www.unevoc.unesco.org/bulletin>

Learning To Do: Values for Learning and Working Together in a Globalized World

UNESCO-APNIEVE Sourcebook No. 3 for Trainers, Teachers and Students in the Area of Technical and Vocational Education and Training
(UNESCO-UNEVOC and UNESCO-APNIEVE)

Editors: Lourdes R. Quisumbing and Joy de Leo
Chinese, English

This book examines values education in the workplace. It is comprised of modules related to core values that are crucial for personal development. Integrated into TVET, these values can prepare workers and citizens with the knowledge, values,

attitudes, behaviours and skills they need to be able to participate fully in their economy and work—effectively and responsibly in a globalized world.

This Sourcebook is conceived as a teacher's manual. It follows the steps of a holistic teaching/learning cycle and contains lesson plans that can be adapted by TVET educators to be integrated into their own training packages, lessons and resource materials.

Shortly after the English version of the Sourcebook appeared in 2005, it was translated and published in Chinese.

Access or order the Sourcebook free of charge at: <http://www.unevoc.unesco.org/publications>

Agencies for International Cooperation in Technical and Vocational Education and Training: A Guide to Sources of Information

Published by UNESCO-UNEVOC
English

This Donor Agencies Guide has been conceived for key personnel engaged in the development of projects and programmes. The guide provides an overview of sources of Official Development Assistance by the twenty-two Member States of the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (OECD). Its focus is on technical and vocational education and training. The Guide includes information on:

- Current trends in international co-operation policies;
- Potential donors and their policies;
- Donors' requirements concerning project definition, project and budget management, assessment and evaluation techniques, and reporting procedures.

Access or order one of the most frequently requested titles free of charge from: <http://www.unevoc.unesco.org/publications>

Motivating for Skills Development: A Campaign Package

English, French, Portuguese and Creole (DVD with sound track)
English (booklets with texts, illustrations and transcript of sound tracks)

The aim of the 'Skills Development Package for Learning and Working' developed by UNESCO-UNEVOC is to help facilitate the organization and implementation of awareness and motivation campaigns for marginalized groups in least-developed countries.

The idea behind the Package is to offer a platform and produce an environment that would motivate people living in adverse economic conditions to enrol in TVET courses and take up self-employment activities in order to improve their economic situation.

The backbone of the Skills Development Package for Learning and Working is a set of DVDs. These are complemented by a series of documents that support the material that can be viewed on the DVDs. The Package is in itself not a tool for skills development, but rather an ‘eye opener’ and ‘discussion starter’. It is anticipated that targeted groups will be encouraged to engage in tasks similar to those shown in the DVDs.

Order the Package free of charge from: <http://www.unevoc.unesco.org/publications>

TVET Teacher Education on the Threshold of Internationalisation

(UNESCO-UNEVOC and InWEnt)

Editors: Frank Bünnig and Zhi-Qun Zhao

English

This book has been written as an outcome of the conference ‘Development and Implementation of a Master Degree Standard for Teacher and Trainer Education in TVET in East and South-East Asia’, which took place at the University of Tianjin, China, in December 2005.

The conference represents an outcome of the close co-operation between InWEnt – Capacity Building International of Germany, the Ministry of Education (MoE), Beijing, China and UNESCO-UNEVOC, and it set a precedent for the further development of master degree programmes in TVET.

This conference summary will be of service to both researchers and policy-makers involved in teacher and trainer education in TVET in East and South-East Asia, as well as for the broader context of joint initiatives in the area concerned.

Access or order free of charge from: <http://www.unevoc.unesco.org/publications>

Special Issue of PROSPECTS, Quarterly Review of Comparative Education

(UNESCO-UNEVOC and UNESCO-IBE)

Arabic, Chinese, English, French, Russian, Spanish

Rupert Maclean, Director of the UNEVOC Centre, was Guest Editor of the September 2005 issue of the IBE journal *PROSPECTS*. This issue focuses on the topic of ‘Orientating Technical and Vocational Education for Sustainable Development’ and contains eleven contributions dealing with its various aspects of this theme.

Order the Prospects from: <http://www.springer.com/education>

Vocationalisation of Secondary Education: The Come-Back?

Article, published in Education Today newsletter, UNESCO

In 2005, UNESCO-UNEVOC made contributions to a major article (4 page-spread) in the issue of *Education Today*, the newsletter of UNESCO's Education Sector, on 'vocalisation of secondary education'.

Access or order a reprint of the article free of charge from: <http://www.unevoc.unesco.org/publications>

Meeting Reports

UNESCO-UNEVOC publishes final reports of all the meetings it organizes on its own behalf or in collaboration with other partner organizations. Copies of the reports are usually sent to all meeting participants and to specifically interested parties.

Access or order the UNEVOC meeting reports free of charge from: <http://www.unevoc.unesco.org/publications>

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To inform its public about the main areas of work of UNESCO-UNEVOC and of activities undertaken during each year/biennium, UNESCO-UNEVOC regularly updates and publishes the following materials:

- Mission statement
- UNEVOC in Brief (brochure)
- Flyers on areas of work
- Annual/biennial reports

Access or order these materials free of charge from: <http://www.unevoc.unesco.org/publications>

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Foreword

TVET for the Sustainability of Human Kind

The New Economy is creating new opportunities as well as new challenges and uncertainties. Although the right to well-being is entrenched in the Universal Declaration of Human Rights, millions of people today are living in conditions of extreme poverty, which deny them the opportunity to exercise these fundamental rights. I would like to draw from the reflection made by the Family Care Foundation regarding what the world would look like if it were reduced to the size of a village of 100 people. According to their analysis: 80 people would live in sub-standard housing; 67 would be unable to read; 50 would be among the malnourished and one dying of starvation; 33 would be without access to a safe water supply; 39 would lack access to improved sanitation—and five would control 32% of the entire wealth. This unequal distribution of education and wealth is the root cause of many of the problems facing the world today. It is our business to remedy this situation before we come to regret not having remedied it. Education and training have a key role to play in this regard.

The former Secretary-General of the United Nations, Kofi Annan, repeatedly reminded us that education is the key to unlocking the cage of human misery; the key to delivering the potential of every human being; the key to opening up a future of freedom and hope. There is a general consensus that education can pave the way to freedom from poverty and hunger. Even primary education by itself has a number of positive effects on development: an increase in productivity in the formal and informal sectors of the economy; a positive effect on innovation in agriculture; a decrease in birth rates; and an improvement in health and nutrition—educated people are healthier because they are more likely to eat a properly balanced diet.

The Bonn Declaration on Learning for Work, Citizenship and Sustainability, resulting from the UNESCO Conference ‘Learning for Work, Citizenship and Sustainability’ in October 2004, states that technical and vocational education and training (TVET) is the master key that can alleviate poverty, promote peace, conserve the environment, improve the quality of life for all and help to achieve sustainable development.

Work is a major feature in most people’s lives. Not only does it provide them with the means of survival in terms of food, clothing and shelter, but the type of

work undertaken by individuals and groups also has a major impact on their self-identity, social status, standard of living and quality of life. TVET is currently faced with major implications posed by the displacement of the traditionally strong focus upon so-called manual work in favour of mental work—the shift from the Industrial Age to the Information Age. The meaning and practice of work are also changing as globalized networks of production and trade spread across the globe. The boundaries between manual and mental work are fading away and becoming problematic, as many traditional forms of work, and preparation processes for learning to work, undergo change.

TVET is concerned with the acquisition of knowledge and skills for the world of work to increase opportunities for productive work, sustainable livelihoods, personal empowerment and socio-economic development in knowledge economies. To increase their chances for employability, young people and adults need skills that are adaptable and relevant to the demands of today's societies, which require individuals to possess a combination of knowledge, practical and social skills and positive attitudes and the ability to adapt to rapidly changing work environments.

There is a timely need to re-examine important matters relating to the changing world of work, such as educational and training institutions, learning processes, necessary competencies and effects upon labour markets, school-to-work transition, the role of gender, matters of equality and equity, the respective roles of government, business, industry and trade unions, the dominant didactics for learning a profession, the assessment of competencies, declining birth rates and the ageing workforce, amongst many others. This is merely a brief listing of aspects that are examined and documented in this *Handbook*.

There are great expectations that TVET can contribute to the achievement of the Millennium Development Goals relating to Education for All by overcoming the long-existing disparity between North and South, reducing poverty and promoting social inclusion. However, its widespread implementation requires considerable investments. Consequently, when planning for TVET, policy-makers and decision-makers must be able to make informed decisions that are supported by evidence-based information. There is, unfortunately, a paucity of evidence-based information about TVET. This *Handbook*, therefore, will start to fill that critical information gap by re-examining the world of work and its diverse aspects and documenting them in order to provide the best answers and best practices to improve TVET. It should assist those involved in TVET at any level in making informed decisions.

For the first time in the history of TVET an important reference tool has been produced that provides a very comprehensive coverage of research, policy and practice within a single source. Through this seminal contribution, the UNESCO-UNEVOC International Centre has been successful in capturing much of the knowledge of the world's leading experts in the field for the benefit of future generations. As the Assistant Director-General of UNESCO, I am very encouraged by this collaborative scholarly effort. It is through initiatives such as these that the status of TVET will be enhanced so that it can fully play its role as an enabling instrument for economic prosperity and social development. I commend Rupert Maclean, Director of

the UNESCO-UNEVOC International Centre, for spearheading this project which also assists UNESCO in contributing to critical reflection in education and training and to capture, preserve and share knowledge for the betterment of humankind.

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Nicholas Burnett

Introduction

Rupert Maclean and David N. Wilson

1 Background: The Study of Work and Occupations

The interest of researchers in various academic disciplines of study, in work, occupations and employment-related areas is long standing. In the case of sociology, for example, it has existed since the beginning of the discipline's history in the mid-nineteenth century. Emile Durkheim (1933), in his first major work entitled *The Division of Labour*, first published in 1893, examined the relationship between employment in modern industrial society and the creation of social order. It is both natural and logical that this should be the case, because work is a central activity in the lives of most people and all societies. However, it is only since the research undertaken at the University of Chicago, particularly by Everett Hughes and his associates from about the mid-1940s, that occupational sociology has achieved independent status as an area of study within sociology. Before this time, despite the large and often rich body of empirical studies that had been accumulated over the nineteenth century, the content of this area was decentralized amongst a wide range of subject areas within sociology, such as industrial sociology, rural sociology or demography.

In the United Kingdom and continental Europe interest in sociological aspects of the world of work can be traced back over approximately two centuries, an examination of important aspects of this area being found in the writings of various social philosophers, economists, historians and (later) sociologists. In 1776, for example, the father of classical economics, Adam Smith (1937), published a book called *An Inquiry into the Nature and Causes of the Wealth of the Nations* in which he explored the effect of the division of labour on the productivity of labour. As part of his analysis, Smith examined the social impact of changed production methods on various occupational groups and the broad society.

Some early sociologists, such as the founding fathers of the discipline, Marx, Weber and Durkheim, examined work in a relatively broad sense, largely focusing upon a study of the labour force and alienation, which they regarded as being particularly important. Only to a limited extent did they undertake a study of any particular occupation, trade or profession. Emile Durkheim (1933), in *The Division of Labour*, examined and emphasized the importance of changes in the division

of labour and the effect this would have upon the move from a state of mechanical solidarity to that of organic solidarity within a society; Karl Marx (1961, orig. 1846) stressed the fundamental importance of labour in human history and in helping to define the humanness and identity of mankind; and both he and Max Weber (1947, orig. 1922) examined the relationship between work and alienation, Marx being primarily concerned with the alienation of factory workers while Weber expanded the concept of rationalization. Weber also undertook a detailed study of particular occupations, including the political, the scientific, the professional and the Chinese literati.

Some other precursors of modern sociology who showed a particular interest in the study of work and/or occupations include: Frederic Le Play (1937) who, in his mammoth six volume work entitled *The European Working Classes*, undertook empirical studies of the life and working conditions of various occupational groups; Charles Booth (1902) who organized investigations into the *Life and Labour of the People of London*; De Mann's (1929) studies of the manual worker; and Dreyfuss's (1938) work on the salaried employee.

In the United States, the development of the sociology of occupations appears to have occurred almost as a by-product of the work of Robert Park (1925) and his associates at the University of Chicago in the 1920s and 1930s. As part of their major interest in the ecological and social integration of various groups living in inner city, ghetto-type areas of Chicago (see Wirth, 1928), Park and his fellow researchers studied a variety of low status, often marginal occupations such as the hobo (Anderson, 1923), the prostitute (Donovan, 1920), the taxi-dance-hall girl (Cressy, 1932) and the professional thief (Sutherland, 1937); and generally adopted a social-psychological and social-interactionist approach to the occupation studied. They were interested in what Everett Hughes calls 'the dirty work in society', and the ways in which the practitioners of such work were able to overcome or control the problems and tensions associated with it.

Some went beyond this narrow focus on low-status work to study various more respectable occupations whose practitioners were not concentrated in the inner city areas. Examples are the studies undertaken on sales staff in shops (Donovan, 1974a, orig. 1929) and the school-teacher (Donovan, 1974b, orig. 1938).

Later studies undertaken by Mayo and Lombard (1943), and by those involved with the famous 'Hawthorn studies', widened existing approaches to the study of work and occupations. These studies were concerned with important aspects of industrial sociology, such as the study of work organizations, industrial relations and human relations in industry; and they adopted a psycho-sociological approach to the study of men and women working in groups.

Academic interest in and research about the sociology of work and occupations waned in both Europe and North America from the late 1930s until after the Second World War. Although there are no doubt many reasons why this eclipse occurred, one could speculate that it was partly due to a reduced interest in and confidence about the value of the empirical, largely descriptive studies of occupations that had been generated; and was also due to the fact that despite the large number of studies

accumulated, no truly satisfactory theoretical framework for the study of work and occupations had been developed. It was not until the work of Everett Hughes, a major intellectual figure at the University of Chicago whose influence was substantial from about the 1940s onwards, that a coherent sociological approach and theoretical framework within which occupational groups could be analysed was developed. This framework evolved as a result of many diverse types of work being compared in order to identify the common denominators.

It was only after a plausible theoretical orientation was accomplished that occupational sociology achieved the academic status of becoming a sub-field of sociology, being taught as a separate field of study in many European and American universities. The growing importance of and interest in this area was clearly indicated when a major international journal, *Sociology of Work and Occupations*, specifically devoted to this area, was founded in 1974.

Everett Hughes (e.g. 1937, 1949, 1952, 1958a, 1958b, 1971) is the pivotal figure in occupational sociology. Hughes states his goal as being 'to learn about the nature of society itself from the study of occupations', the more immediate purpose of his study being to describe and understand the behaviour of the people who are involved in different kinds of work (Soloman, 1968). Hughes' influence on this area of study has been enormous, for apart from his own insightful and voluminous research output, virtually all of the major figures in occupational sociology, such as Oswald Hall (e.g. 1948), Howard Becker (e.g. 1952), William F. Whyte (e.g. 1943), Blanche Geer (e.g. 1966), Julian Roth (e.g. 1963) and Dan Lortie (e.g. 1975), were either students of Hughes or were clearly influenced by his ideas and theoretical approach to the study of work and occupations. Hughes and those influenced by his approach to the study of work were responsible for extending and diversifying the body of studies on occupations to include doctors, lawyers, teachers, dance musicians, white-collar workers, railroad workers, soldiers, ministers, cleaners, nurses, librarians, salesmen, boxers, 'quacks' and real-estate agents.

As a field of study, the sociology of work and occupations may be defined as the application of the principles and concepts of sociology to a particular social phenomenon—that of occupational life and people at work. Nosow and Form (1962, p. 3) argue that, as a sub-discipline within sociology, the sociology of work and occupations is organized around five substantive themes. These are: (a) the social nature of work and related phenomena such as leisure activities; (b) the analysis of occupational structure and the causes of changes within it; (c) the study of individual occupations in terms of such matters as recruitment, training and careers; (d) the ways in which the occupational structure and individual occupations articulate with other segments of society, such as in the case of occupations and systems of social stratification; and (e) the study of a particular occupation in order to highlight a problem in the broader society, such as those who are employed in the mass media and the operation of the political structure. These five areas are, of course, not totally self-contained for there are substantial areas of overlap between them.

Occupations may be viewed as a cluster of skills belonging to those who also perform similar roles (Nosow & Form, 1962). The thing which identifies the occupational role—and separates it from other roles—is that it is a specific activity with a market value which people are paid to perform.

2 Why Study Work and Occupations?

Several interrelated reasons may be advanced to explain why the study of work and occupations warrants the serious attention of researchers, policy-makers and practitioners.

Work is an important and highly pervasive activity in the lives of many people, for a substantial part of men's and an increasing percentage of women's lives are spent in work-related activities. In view of this, many people have an interest and curiosity about the occupational world. In addition, since work consumes so large a part of the waking hours of many people, it follows that it should be of major interest concerning our understanding of human behaviour (Pavalko, 1972). The task of the sociologist is to develop concepts and categories which will assist in an explanation of the organization of society, and the behaviour of people within it, and so the study of work and occupations is of importance if this is to be achieved.

Occupations are also social roles. As such, specific occupations serve to locate their incumbents in a matrix of other social roles and link them to others through work-patterned interaction. When Hughes (1958a) refers to the 'social drama of work', he draws attention to the fact that, just like the playing of other social roles, work involves the process of social interaction with others.

Occupations are a fundamental link between individuals and the larger society, because occupational roles are an important element of social structure and so affect one's participation in other segments of society. A person's occupational status is, for example, the main factor which affects his/her entry into and location within the social structure and stratification system of their society (Chinoy, 1955).

It can also be demonstrated that occupational roles are a major source of personal identity, for the nature of work leaves a deep and lasting influence on the lives and personality of people. Hughes (1958a) emphasizes that the social relationships into which the practitioner's work throws him or her has a great influence on their occupational personality; while Waller (1961, orig. 1936), in reference to the work of the professional, puts it this way:

Those who follow certain occupations are continually thrown into certain kinds of social situations. These social situations call for, or are best met by, a certain kind of reaction on the part of the [worker . . .] long practice in the social techniques enjoined upon one in a profession makes these the deepest grooves, and at length they grow so deep that there is no getting out (p. 376).

Following on from this point, it may be said that occupational groups represent distinctive sub-cultures that have a variety of shared norms and values into which the individual is likely to be socialized. The occupational culture can have a substantial

effect on the individual's outlook and identity. Sorokin (1947), in referring to the socialization of the individual into the culture of a particular occupation, says that each occupation tends to remake its members in its own image—the longer the individual stays in the same occupation the deeper being the transformation. Thus, an individual's occupation can be a good indication, in broad terms, of the individual's likely social construction of reality, since a wide variety of attitudes, values and behaviour are correlated with a person's occupation.

The study of work also assists us to understand how social life is possible, because occupational differentiation and independence help to explain how order is maintained in the social structure. Work is an important basis of social cohesion and integration in society, and results in what Durkheim (1933) called organic solidarity.

For all of these reasons, the study of work and occupations is an area of considerable importance which is of both theoretical and empirical interest.

3 Technical and Vocational Education and Training

One important area of work and employment consists of those occupations which centre on the application of technical and vocational skills to the world of work. It is estimated that some 80% of occupations are of this type (UNESCO-UNEVOC & UNESCO-UIS, 2006).

The field of technical and vocational education and training (TVET) has changed throughout history, usually in response to the demands made upon it by the societies it serves. The current term—TVET—requires both definition and differentiation from other designations. Vocational education and training are probably as old as humanity, and knowledge, skills and belief systems have been transmitted from one generation to the next since the origins of humankind.

Over time, various terms have been used to describe elements of the field that are now conceived as comprising TVET. These include: apprenticeship training, vocational education, industrial arts, technical education, technical/vocational education (TVE), occupational education (OE), vocational education and training (VET), career and technical education (CTE), etc. Several of these terms are commonly used in specific geographical areas. For example, in Europe the term vocational education and training (VET) is in common usage, while in the United States the current term is career and technical education (CTE). In addition, many in the field are advocating the use of continuing vocational education and training (CVET). There are also several different dimensions that can be used to define vocational education and training—for example: its venue (company-based, apprenticeship, school-based), character (initial, continuing), etc.

At the second International Congress on Technical and Vocational Education, held in the Republic of Korea in 1999, UNESCO and ILO (in consultation with their respective Member States and partner agencies) jointly agreed upon using the term technical and vocational education and training (TVET) in future in order to unite the field. There has also been discussion to add TVET to the UNESCO 'Education for All' (EFA) and 'Education for Sustainable Development' (ESD) initiatives.

Strengthening and upgrading TVET is also regarded as important for achieving the Millennium Development Goals (MDGs). The definition of TVET adopted at the Korean Congress is:

Those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupants in various sectors of economic and social life (UNESCO, 1999).

The many designations for the field are probably a by-product of practitioners' responses to changes in demand over time for skills and technologies used in workplaces, the globalization of production, the increasing utilization of information and communication technologies (ICTs) and related matters. Similarly, changes in TVET policy and practice reflect differences in opinion among practitioners and researchers. What has not changed, and appears to be increasing, is the growing emphasis on lifelong learning—and re-learning—associated with TVET. Silvern (1968) focused upon this issue while delineating the differences between education and training. He characterized education as 'womb to tomb, erection to resurrection', which can be interpreted to mean lifelong and continuing. His definition of training mirrored its perception at that time as being supplemental to education and focusing upon procedural learning. Subsequently, we have witnessed a convergence between these two—previously distinct—fields.

According to Finch and Crunkilton (1999, p. 14), TVET refers to education and training that prepares persons for gainful employment. TVET can take place either in formal schools (i.e. kindergarten through to grade 12 or 13), or increasingly in post-secondary community and/or technical colleges, or informally by means of training at the workplace and increasingly by distance media. Many TVET educators favour the integration of academic and technical/technological curricula. The education and training of so-called knowledge workers suggests that this integration trend will predominate in the twenty-first century. This is because learning sophisticated technological concepts requires a sound foundation in mathematics, science and communications skills, and also an understanding of technology.

The study of vocational education has a long-standing history, beginning in the 1880s when urbanization, mechanization and industrialization became the major forces driving societies.

By the end of the nineteenth and the beginning of the twentieth centuries, nations established skill formation institutions and organizations, together with branches and sectors. Often, these institutions established close links to business and industry. Other institutions became part of the public domain. Well-developed systems of stratified skill formation developed in public institutions during the twentieth century in Europe, while in English-speaking countries connections with business and industry became stronger. The growth of industrial society, and subsequently post-industrial society, witnessed the changing role of education and training institutions.

In this Handbook the overarching term TVET will be used to refer to all elements of this particular field of study and practice.

4 The Return of TVET to the Development Agenda¹

TVET has fuelled phenomenal economic growth in some countries and fallen short of expectations in others. Globalization is prompting governments to take renewed interest in this branch of education, still perceived by some as second-class.

It is every politician's nightmare: unemployed youths hanging out in the streets with little chance of finding a job or going to university. While the parents of those youths may digest their own dashed hopes for a better life, frustration can reach revolt when that bleak horizon confronts the next generation.

For governments—rich or poor—the solution seems straightforward. Catch those individuals before they become alienated by teaching them skills in secondary school to carve their niche in the labour market. Of course, reality is never so simple, which partly explains why TVET does not achieve acceptance by all. Principals and teachers point to the heavy expenses required to develop curricula, train staff and equip classrooms for these specialized subjects, which generally cost three times more than academic courses. Yet, for many parents and students it remains a 'second-class' education. The truth is that TVET provides training but not the guarantee of a job. Even the world's most sophisticated and expensive programme is doomed to fail if the labour market cannot absorb the students, despite their skills and expectations.

This backdrop has led many experts and policy-makers to conclude that training is best left to the workplace, especially after the radical policy shift by the World Bank, which was once considered TVET's staunchest supporter. The very first World Bank loan for education, granted in 1963, was for TVET, which accounted for about 40% of all educational loans in Sub-Saharan Africa up until the early 1980s. But in 1991, the Bank reversed gears, thanks to a policy paper, co-authored by Arvil Van Adams. Widely respected, Adams retired from the Bank in January 2008 with a single regret:

people took us—the policy—too much at face value. The easy message of our policy was that TVET is not a good investment but that ignores the nuance of what we said. We argued for a shift away from heavy investment in workshops, instructor training and curriculum in order to invest resources into policy development. The point was not to do away with TVET but to reform the policy process (Adams in UNESCO, 2005, p. 2).

In view of the impact that the World Bank's paper had in the following decade over policy leading to loans for TVET drying up, Arvil Van Adams was invited to write a Prologue to this *International Handbook* in which he reviews the non-governmental delivery of TVET in Sub-Saharan Africa.

4.1 A Time-Bomb

But few appreciated the nuance of Adam's analysis and TVET virtually disappeared from the international aid agenda. The World Bank began investing heavily in primary education at the expense of TVET, which now accounts for just 8–9% of

educational spending. International strategies intended to reduce poverty completely ignored the need to develop skills. As Riordan of the ILO puts it:

We are now seeing a skills-divide emerging with the least-developed countries falling further and further behind, particularly in sub-Saharan Africa and South Asia (Riordan in UNESCO, 2005, p. 2).

To this may be added ‘a time-bomb waiting to happen as hundreds of thousands more youth finish primary school and look for secondary education or work opportunities which do not always exist’ (Iwamoto in UNESCO, 2005, p. 2). In many of the least-developed countries, pupils have little chance of either pursuing their schooling or finding a job. ‘So we advocate a new vision of vocational education that focuses on practical or “life skills” integrated at the primary or secondary levels, depending upon the country’s resources’ (Iwamoto in UNESCO, 2005, p. 2).

4.2 A Growing Interest

In countries rich and poor there is a growing interest in TVET. ‘Countries realize that it’s a means to jumping on the bandwagon of globalization. This is reflected by the tremendous shift of employment from the United States and Europe to India and China, where you have such highly skilled work forces. By substantially investing in TVET, these countries laid a major plank in their economic foundations’ (Perera in UNESCO, 2005, p. 2).

For UNESCO, TVET goes beyond the narrow confines of economic planning. It is part of a larger vision for promoting sustainable development. Since its founding, UNESCO has been developing recommendations and organizing policy debates, while serving as a policy advisor for governments trying to reform or create vocational education systems. As UNESCO notes:

In the past, there was a supply-side vision, which created serious problems for developing countries. Either they invested heavily in trying to import foreign models of higher education, which produced a surplus of white-collar expectations. Or they tried to set up highly specialized training schools, which didn’t correspond to labour needs. Today, the goal is to teach students to adapt to changing working conditions, instead of locking them into specific jobs and skills (Perera in UNESCO, 2005, p. 2).

Unfortunately, these new directions do not come with any road maps. As Fred Fluitman of the ILO says: ‘secondary education systems are pretty much the same. But every TVET programme is different and just about every government is constantly trying to tinker with it’ (UNESCO, 2005, p. 3).

In short, constant innovation is a key ingredient in the reform process. If done properly, the results can be spectacular.

The Republic of Korea is an example of how TVET can fuel stellar economic growth. While no model should be emulated, the Korean experience offers key lessons. First, the government took a sequenced approach to education. Money did not start flowing into TVET until the country had nearly achieved universal primary education. By design or accident, major investing began in the early 1980s,

just as labour shortages started to pinch the economy. To make the ‘big push’ into export-oriented manufacturing, construction and service-oriented sectors, the country needed a new stream of skilled workers.

At the same time, policy-makers in the Republic of Korea were beginning to be alarmed by a growing appetite for higher education. People would become ‘over-educated’, expecting white-collar jobs in an economy thirsting for new sources of skilled labour. By expanding TVET, the government planned to satisfy its forecasted labour needs while reducing pressure on universities to enrol more students.

Today, in the Republic of Korea, about 40% of secondary students are enrolled in TVET. Yet, it is still perceived as a second-class education! So the government is trying to open pathways to higher education. First, TVET students are now getting a healthy dose of academic subjects so that they can apply for a place in university. In some schools, academic and vocational students share as much as 75% of a common curriculum. The government is also channelling public and private investment into new post-secondary training institutes to kill the myth that TVET is an academic ‘dead-end’.

The ultimate challenge lies in keeping abreast with technological change. To keep curricula relevant, the plan is to tighten links to the private sector. For example, the Republic of Korea is now experimenting with its own version of Germany’s famous ‘dual system’, which traces its roots back to post-war reconstruction. It has opted for a ‘2+1’ programme, combining two years of classroom studies with one year of apprenticeship.

4.3 Promoting Partnerships

Similar reforms are taking place in China, where a third of all secondary students are enrolled in vocational schools, according to the UNESCO Institute for Statistics. However, it is difficult to draw parallels between the two countries. Whereas a labour shortage shaped the Republic of Korea’s policy reform, China is grappling with a labour surplus, with job creation lagging behind the growing economy. And while the Republic of Korea had the luxury of tailoring a new system to foreseen needs, China must overhaul an antiquated machine.

To do so, China has found an ally in the private sector. Private companies are providing finance, materials, apprenticeships and guidance as representatives sit on school advisory boards. These partnerships reflect a key element of the Chinese vision of lifelong learning: schools will develop and broaden students’ capacities and the workplace will provide training (Hou in UNESCO, 2005, p. 3).

4.4 Open-Door Policy

Ironically, the great bastion of communism may be increasingly lured to the private sector, while countries of the former USSR are not so keen to relinquish State control of their TVET systems.

Here, the Czech Republic is doing well. This is one of the few countries where vocational education enjoys a prestigious reputation. About 75% of secondary students are enrolled in TVET, compared to 25% who attend purely academic schools. Instead of abandoning the system to market forces, the government has given greater freedom to principals and teachers to update curricula and introduce new occupational fields, as opposed to the specific skills associated with a particular job (Klenha in UNESCO, 2005, p. 3).

Another major selling point is the 'open-door' policy to higher education. All secondary students can take the *Maturita* examination, which is a pre-requisite for university entrance examinations. In addition, some of the new post-secondary training institutes (set up over the past ten years) allow students to transfer directly into universities.

The Russian Federation is also planning to decentralize its TVET system, permitting regional governments to administer their own programmes. But it is not an easy task. Most of the schools can barely be called educational institutions. 'But they do keep youth off the street and provide at least one member of a family with a hot meal every day. The State's TVET schools are one of the few remaining welfare institutions for young people and poor families' (Grootings in UNESCO, 2005, pp. 3–4).

Previously two-thirds of Russian workers were trained in elementary vocational schools and 22% of the population have a secondary vocational education, which is 1.5 times higher than those with a college education.

4.5 Finding Funds

Ways are being discussed to enable TVET students to pursue higher education or training. New internship programmes might also dynamize the system. 'The problem lies in finding the money. The private sector is too disorganized for any serious partnership [and so] the State must invest in this generation and the country's future' (Grootings in UNESCO, 2005, p. 3).

Governments far poorer than the Russian Federation are doing just that. Botswana, Ghana and Kenya have been shouldering the burden since World Bank loans dried up in the 1990s. Instead of setting up a separate stream of specialized schools, these countries have 'vocalized secondary education'. While the curriculum remains academic in nature, between 15 and 30% of courses focus on practical subjects like agriculture, management and entrepreneurialism.

The aim is to redress the imbalance between the aims of a purely academic secondary education and the needs of society.

4.6 Investing in Future Generations

UNEVOC has published a series of reports evaluating the impact of vocationalization in Sub-Saharan Africa (Lauglo & Maclean, 2005). There has been tremendous political support for these courses in Kenya, Ghana and Botswana. Botswana, in

particular, has made huge investments to introduce information processing and computer skills at the secondary level.

Ironically, the problem may lie with the high hopes and expectations raised by these courses. Parents are rushing to enrol their children in classes that are supposed to lead to jobs. Demand is so high that it is politically impossible to contain the new curriculum to a few regions where it might be tested and refined. As a result precious resources might have been spread too thin.

The bottom line is that about 80% of jobs in poorer countries require some form of vocational skills. The urgent challenge is therefore to bridge the demand for jobs with the actual needs of society. Politically, governments cannot afford not to invest in the skills of future generations.

4.7 Example: Rebuilding in the Arab States

UNESCO is preparing plans to rebuild the vocational education system in Iraq once the security situation has stabilized. Close to US\$3 million in extra-budgetary funds have been recently earmarked for this purpose and additional funds are promised.

UNESCO is also increasingly active with TVET projects in other Arab States, which are trying to reduce their reliance on expatriate workers. For example, over the past five years, UNESCO has been assisting Libya to vocationalize its entire secondary education system and revise the curricula of post-secondary training institutes. In Bahrain, where 65–70% of secondary students are enrolled in TVET, the government has financed a UNESCO project to create a ‘centre for excellence’, providing specialized teacher-training services and lifelong-learning programmes for adults.

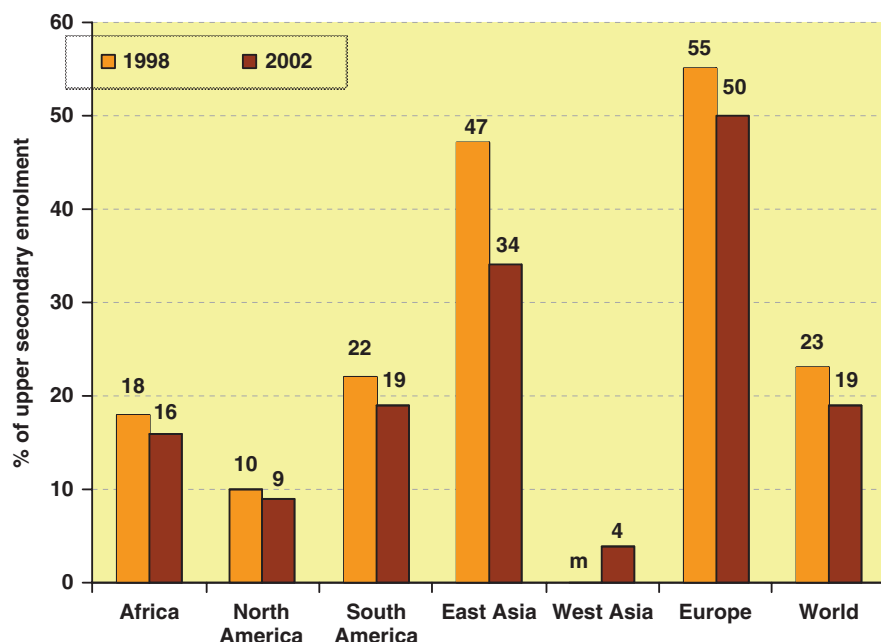
4.8 Global Trends in Technical and Vocational Education

Globally, almost 50 million students were enrolled in technical and vocational education in 2002. Nine out of ten were enrolled at the upper secondary level, typically designed to serve youth aged 15–20 years.

The global average is that one in five upper secondary students is enrolled in technical and vocational programmes. However, the enrolment rates vary widely by regions. In Europe and East Asia, including China, such programmes account for 50 and 33%, respectively, of upper secondary enrolment. In the other regions, technical and vocational enrolment is far less common. In Africa and South America, the share is less than 20%, and in North America and West Asia less than 10 and 4%, respectively (Fig. 1).

Nevertheless, it should be noted that, in the last decade, secondary enrolments have skyrocketed world-wide. From 1998 to 2006 alone, the number of secondary students grew by 15%. However, this growth is largely due to increases in general secondary students.

Public/private partnerships and the involvement of the corporate sector in TVET-related programme activities mounted by UNESCO are becoming increasingly



Note: m = missing

Source: UNESCO Institute for Statistics, Global Education Digest, 2005.

www.uis.unesco.org

Fig. 1 Technical and vocational students as a share of total secondary enrolments, 1998 and 2002

important. For example, in December 2008, UNESCO signed a four-year partnership agreement with the United Kingdom-based StratREAL Foundation² to co-operate in the field of entrepreneurship education in the Arab States region. The objective of this partnership is to support decision-makers in the development of educational policies and programmes that integrate entrepreneurship education in the education systems of the Middle East and North Africa. The activity represents a significant and sustainable contribution to skills development for youth across the Arab States region.

The StratREAL Foundation provided extra-budgetary funds to UNESCO. The activity is being managed by the UNESCO-UNEVOC, which developed the proposal and submitted it to StratREAL through UNESCO Headquarters. Skills development for the world of work needs to be tailored to the needs of the economy and the labour market, given that the private sector is the recipient of the TVET-trained workforce.

5 A Short History of TVET

To trace the origins and development of TVET is a daunting task, because one must simultaneously trace the origins and development of humanity. The approach used here is to develop cross-cutting themes. Among the themes chosen are tools,

technology, culture change, cultural transmission, specialization and fabrication. Researching and writing history is possibly the most inexact science, because the researcher and author must largely rely upon previously published sources. The danger in reliance on such sources is that of repeating the biases of their authors, since ‘history is rarely written by the losers’.

The history of TVET is difficult to trace because it has been embedded in a plethora of other histories. That is to say, until the Middle Ages and the Industrial Revolution, what we call TVET today was not considered very important by historians. Therefore, the researcher must cull many historical accounts in order to glean snippets of TVET history. Having said this, not everyone will share the same enthusiasm for those snippets selected and analysed here. This is because what is deemed important by one person may not necessarily be deemed important by others. With these ground rules, we can now proceed to examine the origins and development of TVET, as perceived by the editors of this *Handbook*.

5.1 A Historical Continuum to Explain Technological Change

Alvin Toffler (1981) situated technological change on a historical continuum that is helpful in setting the context for this chapter. His three ages, or ‘waves’, began with the *Agricultural Revolution*, which took place from about 8000 B.C. to A.D. 1700.

We ourselves suggest that Toffler should have included a *hunting and gathering* stage preceding his first wave. We also suggest that Toffler’s *Agricultural Revolution* could be divided into a *subsistence* phase, prior to 8000 B.C., in which families, clans and tribes consumed what they produced, a *feudal* phase, and then the *family farm* phase, which is now being displaced by the new ‘industrial’ model of an *agro-business phase*. Toffler neglected to consider that his ages/waves overlapped in time and space. The domestication of animals is also a feature of the development of agriculture to which Toffler may have not given sufficient emphasis.

A report from the HapMap project, which built on the decoding of the human genome in 2003, attributed gene changes in East Asians and Europeans 6,000–7,000 years ago to the spread of agriculture to Europe from the Near East at around the same time that the shift to rice farming became widespread in China (Wade, 2006).

Another useful approach to understanding the origins and development of TVET is to trace the development of tools and technologies and relate these to education. Durant (1954) has suggested that a ‘stone in the fist’ may have been the first tool. He also posited that fire led ‘to the fusing of metals, and the only real advance in technology from Cro-Magnon days to the Industrial Revolution’ (ibid., p. 96). He continued by noting:

a rock—sharp at one end, round at the other to fit the palm of the hand—became for primeval man [sic] hammer, axe, chisel, scraper, knife and saw. [...] Gradually these specific tools were differentiated out of the one homogeneous form: holes were bored to attach a handle, teeth were inserted to make a saw, branches were tipped with the *coup-de-poing* [a sharp rock] to make a pick, an arrow or a spear, the rough-surfaced stone became a file; the stone in a sling became a weapon of war that would survive even classical antiquity (ibid., p. 95).

A word about gender and gender differentiation of skills is necessary. From earliest pre-history in most cultures males dominated the hunting of game while females dominated the gathering of wild foods and garment-making. Tool-making may have been dominated by males, perhaps due to their body strength. However, in settled agriculture considerable cultivation was undertaken by females, although it is likely that agricultural implements may have been fabricated by males.

Toffler's second age/wave was the *Industrial Age*, which he dated from A.D. 1700 to 2000. Tjaden (1995) observed that an important characteristic of this period was the separation of goods production from consumption. Eventually, another important characteristic was the division of production into the fabrication and assembly of components, which led to the development of assembly lines. This 'industrial model' also influenced the structure and organization of the education system. It is important to realise that the transitions from one so-called age to another are: (a) not cut-and-dried; (b) slow rather than abrupt; and (c) neither continuous nor complete.

It should be borne in mind that, according to Rifkin (1995), *The End of Work* may *reduce* demand for many occupations, but persons will continue to be needed to fabricate, maintain and repair most of the attributes of our civilization, at least for the foreseeable future. This salient fact suggests that, in the transition from the *Industrial Age* to the *Information Age*, education systems must make provision for the education and training of both 'traditional' and 'knowledge' workers, rather than an 'either/or' proposition. The abrupt termination of one type of education and its replacement is not an option; rather, a lengthy transitional phase is anticipated.

Toffler's third wave, called the *Information Age*, was said to have begun in the United States in the mid-1950s, when 'white-collar and service workers outnumbered blue-collar workers', according to Tjaden (1995). It is argued here that Toffler's paradigm appears somewhat simplistic because what actually seems to be happening is the merger of attributes of previous ages/waves.

5.2 *The Evolution of TVET*

Education and training began in pre-history with the transmission of knowledge and culture from one generation to the next. Culture is defined here as the beliefs, values and technologies shared by a discrete group of people. Hostetter (1974, p. 209) wrote that 'the teaching of technology as part of man's knowledge began when early cave man taught his son to master the skills needed for survival'.

The use of tools, beginning with those made from flint, evolved as humans evolved. Recent primate research has found that tool-making exists among some primates and is transmitted to their young. In the pre-historic *hunting and gathering* society, skills were passed from parent to child as members of small, usually related, migratory groups. The transition from this stage to the settled cultivation of crops marks the beginnings of civilization—and with it recorded history. Tools made this transition possible and grew more diversified because of the transition. The education and training that occurred is best embodied in the Chinese proverb: 'Give a man a fish and he will eat for a day. Teach him how to fish and he will eat for a lifetime.'

Specialization in societies and cultures most probably began during the *subsistence phase* of the *Agricultural Revolution*, when sufficient surplus food was amassed to enable some persons to ‘work’ in areas other than cultivation, hunting or gathering. The first two socio-cultural specializations were likely the clergy and teachers. Specialization probably paralleled the development of settled agriculture and settlements.

Gallinelli explained that:

Children learned the skills of their parents by watching carefully and imitating the process until an exact duplicate could be produced. This method of conscious-imitation was the methodology by which crafts were ‘taught’ in one way or another until well into the 1400s (1979, p. 19)

While ‘at first all of the simple tools, weapons, and religious and domestic objects were formed by the people for their own use’ (ibid.), differentiation between so-called ‘academic’ and ‘training’ teachers likely commenced with further specialization into builders, potters, leather tanners, armourers, wool, flax and cotton-spinners, tailors, etc. In some cultures separate *castes* developed for specific trades—e.g. in India the *patel* caste of leather-workers—while in what became ‘Western’ cultures separate *guilds* developed in the fabrication and commercial fields. Each specific group, caste, guild, etc., designated certain persons as educators/trainers, later called *meister* (or master) in Germany, to supervise the learning of new entrants to their field, known as *apprentices*. In contrast, training for the clergy mainly comprised a *shaman*, priest, rabbi or *guru*, who instructed a group of students. The former group evolved into the skilled trades, while the latter evolved into religious and, subsequently, academic groups. Gallinelli noted that:

In ancient Jewish culture, the law required parents to teach boys a trade. The boys were to go to the Rabbis for religious instruction in the mornings and learn the father’s trade in the afternoon (1979, p. 20).

As tools became more complex, and the knowledge and skills to use them became more specialized, parents and/or elders were no longer able to teach their children the sum total of their knowledge. Gallinelli observed that ‘new social developments went hand in hand with new technology and people no longer had to be the jacks-of-all-trades of earlier times’ (1979, p. 19). An Asian example of these didactic changes is provided by Clark, who quoted the fifth century B.C. philosopher Lao-Tse (also known as Lao-tzu):

‘If you tell me, I will listen. If you show me, I will see. But if you let me experience, I will learn.’ And so began one of the first active learning philosophies (Clark, 1999).

Eventually, their offspring were apprenticed to craftspersons or artisans with the specialized skills and tools for particular trades. These craftspersons would impart the craft at which (usually) they were an expert in exchange for unpaid, or low-paid, work. As the system developed, apprentices began to live with the craftsperson, and received subsistence until becoming accepted as tradespersons themselves. Formal apprenticeship may have begun as early as 2000 B.C. to train scribes in Egypt.

Subsequently, rules governing apprenticeships were included in the Code of Hammurabi in 1760 B.C. in Babylon.

Barlow adds that:

The rise of Athens was accompanied by an increase in the practice of trades required by the growing city. A definite occupational classification developed, regulating various workers into a caste system. The industrial workers, although free people, were generally of the second class. Yet the work of the artisan is our best evidence of Greek achievement.

Throughout a long history, the craftsmen and artisans of Rome were composed of a mixture of slaves and freemen. They acquired their skill in the only way possible, that is, through family apprenticeship (1990, p. 6).

While early Christian monks also divided their days between manual labour and prayer, the early Benedictines organized this regimen into seven hours of labour and two hours of reading. Gallinelli noted that:

This requirement [...] meant that some monks spent their labors copying manuscripts and the writing, illustrating and binding of the manuscripts led to the development of the craft of bookmaking (1979, p. 20).

Gray and Herr noted that:

Owning a set of tools, which were scarce and therefore valuable, and knowing how to use them became an important alternative to agriculture or domestic service. It was during these times that the term ‘journeyman’ [sic] evolved, indicating that an individual owned a set of tools, possessed the skills to use them, and was free to ‘journey’ to various jobs (1998, p. 6).

Craftspersons ‘were eventually brought together by their common interest in a craft to form social groups—and out of these evolved the crafts *guilds* of the Middle Ages’ (Gallinelli, 1979, p. 19). A number of sources provide information on the nature, function and history of the guilds, such as:

Guilds were associations in which, from the 12th century, people who worked in the same trade or craft joined together in a town or city. Guilds wrote their own bylaws, rules that were binding upon all members of the guild. These rules and regulations defined how things were to be made and set ‘consumer-friendly’ prices (CEDEFOP, 2004).

While Gallinelli wrote that ‘printing was not invented until the 1400s’, one may note the interesting co-incidence between:

the invention of moveable metal type, *jikji*, in Korea in 1377, and then 78 years later by Gutenberg in Germany. [...] One can only wonder if the Korean invention of moveable metal type was communicated to Europe, resulting in its re-invention by Gutenberg. Such speculation is facilitated by the proximity to Korea of Kaifeng in China, which was the beginning of the Silk Road which facilitated trade with Europe (Wilson, 2003, p. 19).

Barlow observes that:

The Renaissance, a period of about 250 years, began in the fourteenth century with a great revival of learning—for the few. [...] During the whole of this wonderful and terrifying period of contrasts and conflicts, we may find the stabilizing influence of industry, trade, and craftsmanship. Society became dependent upon the new burgher class and the arts-and-crafts guilds (1990, p. 7).

Guilds functioned to control entry to occupations, thereby protecting the income earned by their skilled labour.

Guilds [...] were an important part in apprenticeship as they established the quality standards for the product and practice. During the peak of the guild system, which occurred between the twelfth and fifteenth centuries, the yeomen were protected by strict regulation of hours, tools, prices, and wages (Clark, 1999).

In addition:

A strict hierarchy held sway throughout Europe under the guild system: apprentice, journeyman, master. The title of master was the only written evidence of competence, while 'certificates of apprenticeship' confirmed completion of the first stage of training; [while] the family generally paid the master a fee to cover the apprentice's food and lodging. The apprenticeship generally lasted from two to four years, and longer in very specialised occupations (CEDEFOP, 2004).

Apprentices were either paid nothing or a small percentage of the wage structure set by the guild. A graduated percentage payment system later developed and became enshrined in legislation. It may be noted that:

The period of apprenticeship ended without a specialised examination when the apprentice was 'discharged'. Each trade or craft had its own customs for this 'discharge' and for the former apprentice's acceptance into the community of journeymen. Journeymen's vocational qualifications were recognised in other countries. Generally without family ties, they travelled from place to place, to augment and broaden their skills by learning from masters in other countries: an early form of occupational mobility in Europe. After journeymen had acquired sufficient experience, they would apply to a guild for admission as masters (CEDEFOP, 2004).

The guilds of craftsmen and small merchants in almost all medieval towns developed this training system in the 14th and 15th centuries across Europe. The Guilds lost their enormous social and economic significance with the demise of feudalism and in the period of proto-industrialisation in the early 19th century (Frommberger & Reinisch, 2002, p. 81).

In the centuries that preceded the introduction of machine-made parts, craftsmanship of a high order was required to manufacture accurate, durable clocks and watches. Such local craft organizations as the Paris Guild of Clockmakers (1544) were organized to control the art of clock-making and its apprenticeship. A guild known as the Clockmakers' Company, founded in London in 1630, is still in existence (Clark, 1999).

The increasing fragmentation of both production methods and the social system led to the dwindling significance of guilds in the late 18th century. Their internal dissolution and their final abolition, sanctioned by the French Revolution, was a stimulus for new organizational and institutional concepts of vocational training. Since all intermediaries between the State and individuals had been removed, and as the traditional craft-trade training forms were not competitive, the State was itself obliged to develop and realise new concepts of vocational training (Meyser, 2002, p. 126).

The *Industrial Age*, defined by Toffler, transformed the fabrication of goods by craftspersons into the fabrication of components for assembly by other, less-skilled, workers. The earliest manifestation of these changes in production began in England, where the textile industry developed and displaced French and Belgian hegemony, thus marking the rise of British economic and, subsequently, military development.

The Industrial Revolution, which began in England around 1760, completed a development whose seeds, both intellectual and tangible, had been sown in the pre-industrial era. In the face of the flourishing textile industry, the prescriptive strength of the old economic order could not resist the sudden growth of capitalism, and the importance of an apprenticeship as a prerequisite for working or managing dwindled.

It is noteworthy that the Elizabethan Statute of Apprentices that dated back to 1563, which approved and sustained the seven-year training period stipulated by guild code, remained in force, at least on paper, until 1814. It was only at the culmination of industrialisation, starting in 1812, that there was parliamentary debate on the retention of the old English economic order which, in practical terms, had long since become defunct. The old, professionally oriented crafts and the country's conservative, romantic bastion took a final stand against the representatives of liberal economic thinking (Deissinger, 2002, p. 33).

Legislation to govern apprenticeship arrangements began in the 1600s in England with 'laws providing relief for the poor' who 'were given an opportunity to become apprenticed to learn a trade,' according to Gallinelli (1979, p. 20). Increasingly, State intervention in Europe and later in North America began to encroach upon the control of the guilds. Gallinelli notes that: 'France established a system of trade and technical schools as substitutes for the apprenticeship system.' He also noted that the German 'apprenticeship system was not nearly as affected as were those of England and France', remaining 'firmly placed within the guilds' (p. 22).

Although the guilds in France were abolished during the French Revolution in 1791, 'modern' vocational education and training may date from the establishment of the *École des ponts et chaussées* by Jean-Rodolphe Perronet in France in 1747. This pioneer institution was the model for The Rensselaer Polytechnic Institute in the United States of America. After the Revolution, the *École polytechnique* was established in 1794 and both institutions established the TVET path followed by France. There are other early institutions whose history is less well-known. One example is given by Derivianko, who traced the development of TVET in Russia, noting that 'on 14 January 1701 [...] the first school of mathematics and navigation was opened in Moscow by decree of Peter the Great, the Russian tsar and reformer' (2004, p. 159).

While better known as philosophers of education, Jean-Jacques Rousseau (1712–1778) believed it important to learn a trade; Johann Pestalozzi (1746–1827), who has been called the 'father of manual training', advocated combining school with workshop learning; and Friedrich Fröbel (1782–1852) focused upon creativity and self-activity when establishing *kindergartens* in the 1800s. Educational reform at the turn of the twentieth century drew from the writings of Pestalozzi and Fröbel and came to be called 'The New Education Movement'.

Barlow noted that 'it would be late in the 1880s before the idea of combining trade and academic education in the school was tried seriously' (1990, p. 8). The study of TVET also has a long-standing history, beginning in the 1880s when urbanization, mechanization and industrialization became the major forces driving societies.

Derivianko indicated that:

In 1866, the Russian Technical Society was founded. [...] One of the departments of this society was entirely responsible for managing primary vocational education and assisted

in opening specialist educational institutions for training master craftsmen and workers in Russia. [...] The Imperial Russian Technical Society developed the principles of specialist education; it also created a number of awards for technical and vocational education and mobilised public support for maintaining existing and opening new specialist educational institutions (2004, p. 160).

Victor Karlovich Della Vos (1820–1890), Director of the Imperial Technical College in Moscow, may be designated as the originator of the *task analysis* method for the sequentialization of working knowledge in vocational didactics, which eventually became the basis for *competency-based* TVET.³ Della Vos drafted the rudiments of this idea in 1868, when he decided to introduce a compulsory work placement for his engineering students to compensate for their lack of practical experience before starting studies. His system mandated that:

Students had to complete six sequential courses in wood-turning, model carpentry, forging, metal-turning, mechanics and mould-making. Course sequences were based on job and task analyses from various occupational fields. This form of vocational learning gained international renown at the 1873 World Exhibition in Vienna under the name ‘Russian system’ (Wiemann, 2002, pp. 141–42).

Apprentices began by learning to perform and master simple tasks. In a precisely predetermined sequence, the tasks gradually became more challenging. After its presentation at the World Exhibition in Vienna in 1873, this method spread to many other European centres of education and training (CEDEFOP, 2004).

Subsequent to the transfer of Della Vos’ system to Germany, it spread to France and North America:

The World Exhibitions in Philadelphia in 1876 and Paris in 1878 also gave considerable attention to vocational training and contributed to the dissemination of the production school concept and the instructional workshop method. Indeed, by 1920, specialised institutes with workshops had been founded everywhere in Europe where industrial potential was to be accompanied by such measures (Meyser, 2002, p. 130).

Field (2001, p. 109) attributes the development of programmed instruction to behaviourism, which arose from Thorndike’s doctoral research. He wrote that Thorndike’s stimulus-response model ‘followed important parallels to Pavlov’s earlier animal experiments’. He further noted that ‘it has been argued that Pavlov’s work was taken up by Victor de la Vos [...] who presented his ideas on task analysis as a basis for curriculum design at the Philadelphia Exposition.’

France founded new commercial and technical production schools after the loss of the war against Germany in 1870/71. By the early 20th century an extensive school-based vocational training system on several levels was in place. These numbered the six *Écoles d’Arts et Métiers*, four *Écoles Nationales Professionnelles* and 70 *Écoles Pratiques* (Meyser, 2002, p. 126).

Hanf describes the impact of Della Vos upon TVET, as follows:

In 2003, 135 years later, several hundred courses across Europe evidently adhere to the principles expounded in 1868. Undoubtedly, the ‘training course’ is the most successful and effective learning system in the short history of industrial vocational training. Its didactic concept has merited an unprecedented dissemination across all European industrial countries (2002, p. 15).

Della Vos' impact was also attributed by SENAI in Brazil to the *serie metódica ocupacionais* [shopwork methodical series] developed by Ricardo Mange in 1934 and adopted by the *Serviço Nacional de Aprendizagem Industrial* (SENAI). SENAI has been replicated in nineteen other Latin American and two Caribbean nations since its founding in 1942.

By the end of the nineteenth and the beginning of the twentieth centuries, nations established skill formation institutions and organizations, together with branches and sectors. Often, these institutions established close links with business and industry. Other institutions became part of the public domain. Well-developed systems of stratified skill formation developed in public institutions during the twentieth century in Europe, while in English-speaking countries connections with business and industry became stronger. The growth of industrial society, and subsequently post-industrial society, witnessed the changing role of education and training institutions, with the establishment of national training institutions, national training boards and, later, the development of regionally responsive and flexible centres of expertise and research.

Several sources provide information on the origins of the present German 'dual system'.

craft trades again became the normal models of occupational training, thanks to the *Handwerkerschutzgesetz* (Craft Trade Workers' Protection Act) of 1897 and the support of policies favouring SME expansion. [...] In contrast to the advanced industrial nations of England and France, this mentality prevailing in Germany guaranteed the survival of the *Meisterlehre* (apprenticeship with a master craftsman).

A second characteristic of the German [dual] system is that the institution of the *Berufsschule* (vocational school) has been a fixture in the vocational training landscape since the end of the 19th century. This has enriched training content but also formally dovetailed theoretical education with practice in a company. The craft trades asserted that companies were the 'correct' learning location for vocational training. *Berufsschulen* arose [...] in which craft trades played a leading role as the 'model of German vocational education', and the successful attempt to rehabilitate the German education system with the help of 'classical German vocational training theory'. However, the dual system is not an educational theory construct. It emerged from the practical consideration that in-company vocational training needed to be complemented (Deissinger, 2002, pp. 30–31).

Elsewhere during the nineteenth century, apprentices often attended 'continuation schools' in the evenings or on Sundays. These repeated the curriculum taught at primary schools and imparted the theoretical knowledge needed for particular trades. By the end of the nineteenth century, these schools had developed into 'vocational schools'. In addition to vocational education and training, students were also taught citizenship skills.

Today, both elements are still part of apprenticeship: learning on the job and in vocational school. That is why it is referred to as the 'dual system' of training (CEDEFOP, 2004).

With the improvement of the steam engine by James Watt in Scotland in 1765, and its initial applications to the railways and textile industries, the *Industrial Age* began. This gave the United Kingdom the impetus to dislodge continental European domination of production and trade. The CEDEFOP study noted that:

The guild system was abolished—along with the traditional seven-year apprenticeship. Untrained, low-paid labourers operated the machinery in the factories. For many years, the rapidly growing industries had little need for skilled workers, so young people received no training (CEDEFOP, 2004).

In England, North America, Australia and elsewhere mechanics institutes developed in the early 1800s, along with ‘charity schools’ to educate the poor. Barlow noted that ‘the General Society of Mechanics and Tradesmen, which was founded [in 1785], had by 1821 embarked upon a full-scale educational program’ (1990, p. 10). Gallinelli observed that ‘the Boston Asylum and Farm School founded in 1814 was one of the earliest of the charity schools, and it provided education for orphaned boys.’ Instruction was also provided ‘in one of several trades’ (1979, p. 23). He further noted that:

The mechanic’s institutes and lyceums provided further education for their members in both day and night school programs. Technical institutes were also established, such as the Rensselaer Institute founded in 1824 (*ibid.*).

Perhaps the most significant government initiative for TVET was the Morrill Act, signed by the United States President Abraham Lincoln in 1862, to establish land-grant colleges ‘to teach subjects related to agriculture and mechanic arts in order to promote the liberal and practical education of the industrial classes’ (Gallinelli, 1979, p. 24).

Gallinelli also noted that ‘one offshoot of the movement [in the U.S.A.] to train engineers was the development of the Manual Training Movement by John Runkle of The Massachusetts Institute of Technology (MIT) and Calvin Woodward of Washington University’. Barlow added William Harris, Superintendent of Schools in St. Louis, Missouri, and E.E. White, President of Purdue University, to this group of educators (1990, p. 15). Gallinelli wrote that while they ‘were developing programs to train engineers’, they:

discovered that the engineering students lacked rudimentary skills in the use of tools and knowledge of basic mechanics. They were impressed by the methods used by Victor Della Vos [...] which were demonstrated at the Philadelphia Centennial Exposition in 1876 (1979, p. 25).

We have observed university engineering students in Brazil being taught workshop skills by SENAI instructors in SENAI schools, which has taken this system even one step further.

Barlow noted that:

the first school to offer specific trade training with supplementary studies directly related to each trade was the New York Trade School, founded [...] in 1881.

In contrast to the plan of instruction of the New York Trade School, the Hebrew Technical Institute, founded in New York City in [...] 1883, offered a greater range of subjects of a general nature. It may be classed more properly as a technical school rather than a trade school (1990, p. 18).

In Ontario, Canada, John Seath, who studied TVET systems in Europe and the USA and later became Superintendent of Education and developed modern technical education; and Newton Wolverton, who inaugurated the first Manual Training

department in 1886 at Woodstock College, played a similar role to that of Runkle and Woodward. It is interesting that Woodstock College eventually became McMaster University, presaging the *academic* and *mission drift* that has been affecting TVET institutions in the late twentieth century.

The respective national association(s) of manufacturers advocated on behalf of TVET from 1895 in the USA and 1897 in Canada. Both initiatives led to the promulgation of federal legislation to develop TVET. In Canada, the Technical Education Act of 1897 provided for the establishment of technical schools, or the addition of technical wings to existing high schools. Landmark legislation in the United States was the Smith-Hughes Act of 1917, which stayed in force until 1963. The establishment of the Toronto Technical High School in 1891 also resulted from lobbying by the Canadian Manufacturers Association and the Dominion and Labour Council. A similar initiative in Brazil in 1942 by the *Confederação Nacional da Indústria* led to the development of SENAI, initially in São Paulo, and subsequently on a national basis.

Other advocates for TVET in the USA during the nineteenth and twentieth centuries included John Dewey, Charles Prosser, David Snedden (Gallinelli, 1979, p. 28), E.L. Thorndike (noted earlier) and Frederick Taylor, the ‘founding father’ of industrial management and workforce education. While these advocates disagreed about the methods and mechanisms for the promotion of TVET, they were in agreement about the value of TVET. For example, Prosser ‘believed that vocational education courses should not be taught by general educators and that vocational education should remain separate from general education’. Dewey rejected the notion that ‘what was good for industry was good for the people’. Instead, he advocated that educators should ‘use industry to make schooling more active and more meaningful to students’ and that ‘education should provide the skills and attitudes for living in an era of science and technology’ (Gallinelli, 1979, p. 28).

Also, in Canada, Australia and the United States of America, the large-scale training provided for workers engaged in munitions and materials production during the First World War was followed by TVET programmes and legislation that set the stage for TVET developments in the 1920s and 1930s. These nations also developed similar relief and training programmes to alleviate the effects of the Great Depression during the 1930s. Similar war-time training initiatives took place during the Second World War, followed by the development of post-war TVET legislation and system-development in Australia, Canada, the United Kingdom and the United States of America.

During World War I, a system was proposed for on-the-job training that would provide more consistent and efficient training in order to more quickly produce trained workers. In 1917, in response to the need of 450,000 new workers by the Emergency Fleet Corporation of the U.S. Shipping Board, Charles R. Allen developed a way of training shipbuilders, which involved four steps: (1) SHOW or prepare, (2) TELL or present, (3) DO or apply, and (4) CHECK or inspect. From Allen’s work and from research done by the Army during World War I several principles of training instruction were developed:

- Training should be done within industry by supervisors who should be trained how to teach.
- Training should be done in groups of nine to eleven workers.

- The job should be analysed before training.
- Break-in time is reduced when training is done on the job.
- When given personal attention in training, the worker develops a feeling of loyalty (McCord, 1976, pp. 32–36).

A great deal of training system design originated during the Second World War in Australia, Canada, the United Kingdom and the United States of America. Many of the antecedents of present-day TVET systems owe their origins to this period. The post-Second World War expansion of community and technical colleges in the USA and Canada utilized wartime TVET lessons to build effective non-degree post-secondary systems.

During World War II, the need for a method of fast and efficient training became urgent. Training Within Industry, an advisory service formed by the National Defense Advisory Commission, developed the systematic on-the-job training method called JIT (Job Instruction Training). There were four steps to this method:

- First, prepare the learner. Put him at ease, explain what the job is, and explain the importance of the job.
- Second, give a step-by-step presentation of the job. Explain the what, when, how, why and where of the job, then demonstrate them. Have the learner explain each step, then let the learner demonstrate each step.
- Third, do the performance tryout. Have the learner do the steps under supervision.
- Fourth, follow-up. Inspect the work regularly (Hardman, 1963, p. 97).

According to Hardman (1963), JIT is useful primarily in teaching manipulative skills, but could be disappointing with more complicated tasks. An advantage of JIT is its flexibility; one variation has the teacher and learner switch roles. In order to be successful JIT requires adequate supervision and uniform application throughout the plant.

5.3 Important Trends and Changes in TVET

History has been defined as the extension of the past into the future. Thus, the intention of this *International Handbook of Education for the Changing World of Work* is to do precisely that. Jacques Delors wrote that ‘the concept of learning throughout life [. . .] emerges as one of the keys to the twenty-first century’. He further noted that the concept ‘goes beyond the traditional distinction between initial and continuing education [and] meets the challenges posed by a rapidly changing world’ (Delors et al., 1996, p. 22).

Another recent trend is enrolment of recent university graduates at community and technical colleges, to add occupation-specific credentials to their bachelor of arts degrees which have not led to their employment. Since many of these (mainly liberal arts) graduates are choosing TVET courses in the community and technical colleges, this trend—called *reverse transfer*—is important and is quite likely to become even more pronounced in the years to come.

One trend, noted earlier, has been the impact of *academic* and *mission drift* upon TVET. While these phenomena have probably always been operative, what seems

to have changed during the past few decades has been the *pace* of these phenomena. Notably, the transformation of ninety British polytechnics into universities in 1995 is viewed as the beginning of this accelerated pace. The impact upon quality TVET has not been viewed in a favourable light. This is because when there is a change in status, prestige, funding, etc., priorities and quality also appear to change—often not for the better.

The education and training of *knowledge workers* requires different educational policies, facilities, curricula and, above all, teachers. Teachers must be transformed from those who *impart knowledge* to those who *facilitate learning*. Curricula must be transformed from mechanisms to deliver facts into mechanisms to promote and facilitate learning and thinking. Some writers assert that a competency-based approach to curriculum development can facilitate this transformation. TVET curricula have been in transition from its *Industrial Age* ‘mix’ of 50% theory and 50% practical to one that is 80% theory and 20% practical, paralleling the transition from the *Industrial* to the *Information Age*. This shift from a *manipulative* to a *cognitive* focus accompanies the convergence of ‘academic’ and TVET curricula.

Knowledge workers may be defined as those who use logical-abstract thinking to diagnose problems, research and apply knowledge, propose solutions, and design and implement those solutions, often as a team member.

The impact of technological modernization upon many aspects of education—and particularly upon curricula—necessitates basing the education of future *knowledge workers* upon a firm foundation. This foundation should include provision of a sound understanding of mathematics, science, technology and communication skills. Rather than compartmentalizing knowledge, technology affects all aspects of life and necessitates a broader understanding of what technologies are, how they work, how they have been applied to real-world problems, and how they affect our lives. This *technological education* foundation at the elementary and secondary school levels should then be augmented with a broad-based curriculum, prior to the commencement of specialization in post-secondary education. To avoid ‘cluttering’ curricula, many education systems have adopted a cross-curricular approach to infuse common themes in as many curricular areas as possible. Moreover, specialization has increasingly differentiated upward from the second to the third level of education.

A policy encouraging *continuous*, lifelong learning should supplement the ‘basic training’ of *knowledge workers* by the delivery of ‘just-in-time’ education and training when new knowledge is required at the workplace. Many assert that individuals are likely to have three or more different occupations and/or careers during their lifetime. This necessitates workers *learning how to learn* in order to recycle themselves when moving from one position or workplace to another.

In order not to overlap or duplicate work by other authors in this *Handbook*, we will end our short historical examination at this point. The historical material in other chapters complements this introductory chapter and enables other contributors to bring our knowledge of the development of TVET up to the present.

Originally, the direct preparation for work was the main goal of TVET and this remains prominent in many developing nations. However, with the technological

revolutions and innovations in science and technology during the twentieth century, new domains of knowledge and new disciplines have become important at all levels of education and training. Further, the *upward differentiation* of TVET from the first to the second level and then to the third level of education was an important development of the twentieth century and set the stage for the twenty-first century. The current focus is increasingly upon preparing *knowledge workers* to meet the challenges posed during the transition from the *Industrial Age* to the *Information Age*, with its concomitant post-industrial human-resource requirements and the changing world of work.

TVET is currently faced with the challenges posed by the displacement of the traditionally strong focus upon manual work in favour of mental work, or at least the changing mixture of competencies required in the workplace. The boundaries between manual and mental work are fading away, as many traditional forms of work and the respective preparation processes for learning to work undergo change.

Key problems in the field of TVET include pathways and content leading to generic or very specific professions and jobs. The dual system in Germany, for example, is an artefact of the German *Berufskultur* concept, while in many other countries a culture (or approach) developed to match labour-market needs with individual education and training in a mixed model of qualifications.

In addition to pathways and content in terms of generic and specific competencies, and the way these goals are being justified at local, national and international levels, new demands in terms of employability, re-training, lifelong learning, personal growth and flexibility, transferability and mobility are imminent.

The terms ‘education’ and ‘training’ also require elaboration. Essentially, the goal of education is ‘to create independent problem solvers [with] sufficient depth of understanding’. In contrast, the goal of training ‘is to teach people to follow prescribed procedures and to perform in a standardized manner’ (Gray & Herr, 1998, p. 159). What appears to be taking place in the changing ‘world of work’ is a convergence between these two—formerly distinct—points of view. This convergence is important for the future of education, particularly TVET.

Draxler and Haddad (2002, p. 4) observed that *knowledge*, ‘both basic and applied, is being generated very quickly and is growing exponentially’. They claimed that ‘more new information has been produced within the last three decades than in the last five millennia’. Their forecast was that ‘we should be poised for dramatic technological advances and breakthroughs in the macro frontiers of the universe on the one hand, and microscopic secrets of the human body on the other hand’.

6 TVET, EFA and ESD

The third goal of the Education for All (EFA) Framework for Action adopted in Dakar, Senegal, in 2000 (UNESCO, 2000) stipulates that the learning needs of all youth and adults should be met through access to appropriate learning and life-skills programmes. Since this is basically what TVET does, the linkage between the two thrusts already exists, but must be strengthened and broadened in the future.

The fourth EFA goal seeks to increase adult literacy rates by 50% by 2015. The adult and continuing education role played by TVET institutions has contributed to the improvement of literacy in the past, and should continue to do so in the future. Further, it must be recognized that ‘literacy’ itself *also* changes over time; and that Education for All does not necessarily mean the *same* education for all. The literacy requirements of both globalization and technological change necessitate enhancement of literacy education and training to keep pace with these phenomena.

Fosen (2002) noted that the UNESCO-UNEVOC International Centre foci are quite similar to these EFA goals. Therefore, ‘potential synergies’ were suggested through integration and linkage. It was noted that the long-term UNESCO objectives established at the Seoul Congress (UNESCO, 1999) were:

- To provide TVET for all;
- To orient TVET for sustainable development;
- To strengthen TVET as an integral component of lifelong learning.

Meanwhile, Atchoarena (2000) has advanced an emerging policy and research agenda that included three areas:

- The transition from school to work, including the need to make TVET institutions more responsive to the needs of the labour market. This concern motivates the global interest for apprenticeship schemes and work-experience programmes.
- Reforming the institutional framework to finance and govern TVET—a key principle being partnership with industry. The establishment of national training boards and of national training funds represents an important trend in this effort.
- Promoting competency-based training and establishing national qualification frameworks are also a significant trend in an increasing number of developing countries in Africa, Asia and Latin America.

The Center for Occupational Research and Development (CORD) in the United States surveyed industries, commerce and governments in 2000 to identify desirable worker attributes for the twenty-first century. CORD’s list includes:

- Basic skills, including English;
- Planning, decision-making, critical thinking and problem-solving;
- Inter-personal communications skills, sensitivity to workforce diversity and cultural awareness;
- Ethics, management and leadership skills;
- Hands-on training in specific demand occupations;
- Computer training including Internet training.

Our own list is given in Table 1.

SEAMEO (2001) identified eleven important trends and directions for TVET in its member nations, as follows:

- Clear national policies for TVET;
- The concept of lifelong learning;

- Competency-based training (CBT);
- Development of demand-driven TVET;
- Flexible TVET delivery systems;
- Encouraging a competitive spirit among TVET providers;
- Strong public TVET systems;
- Recognition of TVET;
- Quality output and outcome;
- Research and evaluation to improve TVET;
- Apprenticeship systems.

Table 1 Desirable worker attributes

Personal competencies	Technical/professional competencies	Inter-cultural competencies
● The ability to communicate effectively; ● Tolerance for ambiguity; ● Demonstrated leadership.	● Problem-solving; ● Up-to-date technical knowledge; ● Negotiation skills; ● Strategic thinking/planning. Ability.	● The ability to operate in other cultures; ● International job experience; ● Language capabilities.

7 Key Issues and Challenges Concerning TVET

7.1 The Image and Status of TVET

TVET has consistently faced problems stemming from the negative image commonly held by students, parents and many sectors of societies. This issue is also related to the lack of student motivation to enrol in TVET programmes. These difficulties must be met with a renewed effort to raise the public perception of TVET. There are available some excellent examples of the promotion of TVET for employment. One aspect of this promotion has to do with the following issue.

7.2 After ‘Basic Education’, What?

As nations implement Universal Primary Education and proceed to consolidate nine or more years of ‘basic education’, other countries have already achieved universal access to secondary education and are increasing participation in post-secondary education. This progression results in the *upward differentiation* of TVET from primary to secondary and secondary to post-secondary levels of their education systems. Issues of *access* to education and *equality* of treatment within education become increasingly important. An important question concerns the fact that after nations have implemented basic education they must then effectively address

the question of student flows into ‘academic’ and/or TVET streams, which is also an *access* and *equity* issue. In nations where unemployment is endemic, TVET, particularly in areas fostering entrepreneurship and small enterprises, becomes increasingly important for the future. Tilak (2003) characterizes TVET as an ‘equity measure’ because it promotes ‘equity with a rural bias and serves the needs of relatively poor people’, as well as being an ‘antidote to urban-biased elite education’ (p. 675).

7.3 The Promotion of TVET for Girls and Women

This is essentially an issue of *access* to TVET and, once girls and women enter TVET institutions, how they are received and accommodated. While many exemplary programmes have been developed and implemented during the past several decades, there still remains considerable work to be done. Changing the ‘macho’ image of TVET participants and workers has not been easy, but it has taken place. One of the best examples was the programme developed by the Canadian International Development Agency for SENAI in Brazil in the 1990s. The extension of TVET to occupations that are relevant to girls and women has also contributed to the increased participation of women and girls. Attracting more female instructors and administrators into TVET is going to be a major challenge in the future. However, as good as previous aid and development initiatives were, an evaluation of aid provided by DANIDA (2002) noted ‘the weak involvement of women in Danish-supported VET activities’. This suggests that these initiatives need to be increased in the future.

7.4 TVET Planning

It is imperative to recognize that most UNESCO Member States are at different stages of social and economic development. This has a direct bearing upon TVET needs and training systems; therefore, each nation must plan relevant TVET institutions and programmes to meet its current and projected future needs. The length of compulsory schooling, the percentage of participation in education, the locus of TVET and many other factors reinforce the necessity to plan for the specific conditions existing in each nation. Abrahart and Verme (2001) stress that labour-market policies should ‘fit in with education priorities’ and ‘should be directed towards basic education or towards adult re-education and retraining’ (p. 127).

Although there has historically been a time lag in the collection, processing and analysis of labour-market information (LMI), the rapid pace of workplace change necessitates its timely provision to TVET institutions in order to prepare workers with new skills and to re-train existing employees. Moreover, the acceleration of globalization and the outsourcing of both blue- and white-collar employment have made both human-resource planning and TVET planning more difficult.

Several developing nations have addressed problems of youth unemployment, the vocationalization of secondary education and population growth by promoting *entrepreneurship* education and training. The DANIDA evaluation carried out in 2002 noted that entrepreneurship training is an important activity in private-sector development and much training is provided for this in DANIDA-supported programmes. They cite the Micro-Enterprise Development Project for the *jua kali* (informal) sector in Kenya, the innovative Manufacturing Advisory Centre (MAC) in South Africa, the small and medium enterprise (SME) sector in Uganda, including the introduction of entrepreneurship curricula in both schools and polytechnics, in collaboration with DANIDA and the Japan International Co-operation Agency. Similar initiatives have been undertaken in Botswana by the Department of Vocational Education in the Ministry of Education.

TVET institutions should improve their capacity to make use of LMI, including market signals, indicators and intelligence, for planning and curriculum modernization. Governments should develop strategies to help TVET sectors respond effectively to labour-market needs and to deliver training programmes to respond to these needs. TVET institutions should also maintain and enhance their linkages with employers and develop capacity to gather LMI to contribute to the curriculum development process.

7.5 TVET Facilities and Equipment

A perennial problem in TVET is the high cost of construction, equipment, maintenance and the provision of consumable training materials. Routine and preventive maintenance have also constituted perennial problems. These issues have implications for TVET finance, instructor training, curriculum development and the delivery of instruction. If one of these attributes is diminished, the others are affected. Many TVET systems have utilized cost-recovery, industrial levies, linkage with enterprises and employer participation mechanism to address this issue.

7.6 Workplace Health and Safety

The impact of HIV/AIDS upon youth and working-age populations is a major challenge to be faced by TVET. If the very youth and workers educated and trained in TVET programmes are rendered incapable of working due to HIV/AIDS, then the investment in their future is lost. Moreover, since teachers and instructors have also suffered a high incidence of HIV/AIDS, the very educative process is in jeopardy. The lack of sustainability for both populations is poignant. The DANIDA evaluation mentioned above (2002) noted that 'HIV/Aids awareness-raising activities have been integrated into all DANIDA-funded VET programmes'. This newest challenge has overshadowed traditional issues of workplace health and safety that have always

concerned TVET personnel. However, all of these issues will continue to be of extreme importance in the near future.

7.7 The Organization and Administration of TVET

There are many systems and variations for the organization, governance and administration of TVET. While the majority of TVET systems are public in nature, others are para-statal and still others are private. Within some governments, the locus of TVET has alternated between the ministries of education, labour and specifically TVET. *Dual systems* merge public and private organization, administration, finance and delivery. During the past two decades, an increasing number of national TVET systems have been re-structured under the aegis of national training boards or authorities. It is likely that this trend will continue in the future. The *management of change* is important to ensure that TVET systems keep pace with technological change and the needs of each nation. This is equally important in the organization and administration of TVET to prevent ossification. CINTERFOR (2000) highlighted ‘the importance of management training’ for TVET administrators. Similarly, the DANIDA (2002) evaluation noted ‘the shift in recent years in the focus of VET programmes, from technical skills to organisational and management issues.’ This will continue to be an important issue in the future.

7.8 TVET Curriculum Reform and Development

In many nations TVET curricula have lost their relevance to the requirements of the labour market. In other nations, for a variety of reasons, employers prefer to employ untrained youth or ‘academic’ graduates and provide on-the-job training. One salient trend is the growing convergence between TVET and ‘academic’ curricula, resulting from technological change. In addition, the ‘traditional’ curricular balance between *theory* and *practice* has shifted in recent years. TVET curricula need to respond to these trends by enhancing the ‘foundation’ provided to students in mathematics, science, communications and an understanding of technology. Some exemplary new curricula have been developed in *mechatronics*, biotechnology, ICTs, robotics, rapid prototyping and similar ‘new’ fields. A related issue concerns *who* participates in curriculum development. If the needs of the workplace are to be met, then workplace participation in curriculum development—through advisory boards or other mechanisms—is even more relevant than in the past. Another curricular issue is the movement to competency-based curriculum development and instruction.

7.9 Teaching and Learning

As TVET becomes increasingly more knowledge oriented, the role of the teachers and instructors must change from the didactic imparting of skills and knowledge to

the *facilitation of learning*. This requires a quantum change on the part of TVET teachers and instructors, but is an essential step in the education and training of *knowledge workers* for the workplaces of the future. The changing role of TVET instructors involves ‘linking occupational related (academic) studies with technical subjects’, according to CINTERFOR (2000). The increasing use of ICT and other media also contributes to this shift in teaching and learning methodologies. Since many nations have developed dedicated institutions for training TVET and polytechnic personnel, change should also take place in these institutions in order to foster the desired teaching and learning methodologies.

7.10 TVET Teacher Education

UNESCO-APEID noted that the second International Congress on TVET in Seoul (UNESCO, 1999) called for ‘a new breed of TVET teachers and a new paradigm of training them’. The round-table held by UNESCO-APEID called for ‘the development of prototype training materials that model effective and responsive content and the application of learner-centred approaches’. The Philippine Technical Education and Skills Development Authority (TESDA) highlighted ‘inadequacies in knowledge, skills and industrial experience’ of TVET teachers and noted that they ‘must be able to transmit to the trainees actual occupational and practical skills which are relevant to present practices in the workplace’. Similarly, CINTERFOR (2000) noted that ‘broadening the role for instructors will require changes in the way TVET instructors are educated in teacher training courses.’ In addition to modernizing pre-service TVET teacher education, increasing attention must be devoted to the in-service education of existing TVET personnel, otherwise these desired changes may not be achieved—and so will be lost.

7.11 TVET Teachers’ Conditions of Service

In some nations TVET teachers and instructors are not treated in the same manner as are ‘academic’ teachers with regard to their various conditions of service. In particular, issues of different terms for remuneration, promotion and benefits are a source of frustration. This often leads to alienation and high teacher turnover, especially when highly qualified TVET personnel can be tempted away by higher salaries in commercial enterprises.

7.12 Relationship Between TVET and Enterprises

As has already been noted, employer participation in curriculum development has become increasingly important. In addition, TVET personnel need to be encouraged to participate in industrial attachments in order to both maintain viable

relationships with employers and to enhance their knowledge and competencies. Similarly, the development of viable student attachments is increasingly important. The improvement of linkages with enterprises can be accomplished in many ways—one important mechanism being through public/private sector partnerships. The DANIDA (2002) evaluation highlighted the importance of private sector development programmes that link Danish enterprises with enterprises in partner countries in which DANIDA finances related training activities with up to 9% of the total cost of training. This new departure in bilateral development assistance might contribute much to addressing issues of industry/TVET linkages and finance in the future.

7.13 The Growing Importance of ICTs for TVET

Information and communications technologies (ICTs) have become increasingly important for TVET, both in terms of content and delivery. The addition of ICTs to TVET programmes and curricula (preferably as part of a cross-curricular focus) will assist modernization of the field. The use of ICTs to deliver TVET courses, in both formal and informal settings, will assume even greater importance in the near future. The ICT contribution to the development of teaching and learning resources has been phenomenal and, if anything, is likely to continue to increase in the near future. One important example is the increasing usage of simulation software, which some claim can substitute for some of the ‘hands-on’ manipulative workshop training in TVET. Another important aspect of ICTs has been the exchange of TVET information between nations through the UNESCO-UNEVOC network, the ILO network and other multi-lateral and non-governmental networks.

7.14 TVET Finance

With even traditionally well-funded TVET institutions experiencing financial difficulties, it is and will increasingly be necessary to develop additional sources of finance. The issue of public/private sector partnerships noted above is one avenue for broadening participation in TVET funding. Cost-recovery has traditionally been an available option and is becoming even more attractive in the new Information Age. Abrahart and Verme (2001) stress the importance of ‘the use of student or trainee fees for TVET’ with exemptions for unemployed and government-sponsored trainees (p. 127). They are sceptical about rate-of-return studies, noting that higher returns to general education ‘may say just as much about excessive costs and the poor structure of vocational education systems as it does about the subsequent benefits to students’. Here, they mirror our own scepticism about World Bank rate-of-return-based policies favouring decreased investment in TVET. The traditional ‘levy finance’ systems remain viable options. Many post-secondary TVET institutions have developed new sources of finance during the past few decades. One example is

the national training funds referred to earlier. Part of these initiatives also involves donations of expensive and rapidly-obsolete equipment to TVET institutions by co-operating enterprises. Tilak (2003) notes that TVET is ‘necessarily expensive’ and cautions that ‘poor investments cannot yield attractive returns’.

7.15 Testing and Certification

While national systems of testing and certification remain necessary and continue to require improvement, one salient impact of globalization has been the international recognition of qualifications. The establishment of national training frameworks in a large number of nations has begun the broader recognition of competencies and qualifications. The UNESCO-APEID round-table referred to earlier identified many important issues concerning the role of national occupational standards in TVET curriculum development. These issues are also of major importance in the design and development of testing and certification mechanisms and will continue to be of importance in the future. The CINTERFOR (2000) and UNESCO-UNEVOC (2001) small island States’ meetings added the issue of ‘accreditation framework(s) for national, sub-regional’ and regional recognition of TVET qualifications. This issue is related to the larger regional accreditation systems in Europe and elsewhere. Both types of regional recognition will continue to be important in the future.

The impact of international student testing—the International Association for Educational Achievement (IEA), the Trends in International Mathematics and Science Study (TIMSS) and the Programme of International Student Assessment (PISA)—while more visible upon ‘academic’ education, is also influencing TVET. Also, the desire of international/multinational employers to hire persons with recognized qualifications is affecting (and will increasingly continue to affect) hiring practices. While this is current practice at the university level, it has also become increasingly important at the technician, technologist and skilled-trades levels.

7.16 Some Other Important Issues

Other related issues include the Prior Learning Assessment and Recognition (PLAR) articulation between TVET and ‘academic’ institutions and programmes, ‘reverse transfer’, the enrolment of degree-holders in community and technical college technical programmes and joint degree-diploma programmes. Academic drift and mission drift concern the conversion of polytechnics and other post-secondary TVET institutions into universities. These newer trends are highly likely to increase in importance in the future. In one respect, these issues are all related to the progression to continuing and lifelong learning. These issues also relate to worker re-training, upgrading and job change. The promotion of ‘a seamless educational infrastructure in collaboration with trade unions and employers’ organizations’ is noted by ILO/CINTERFOR to be one of the major changes in TVET in the Caribbean

(CARICOM) nations. Similarly, the TechPrep initiatives in the United States have developed a ‘seamless’ education and training infrastructure which begins in high school Grade 10 and flows through completion of community and technical college programmes.

8 Conclusion: Where Next?

There is a need to re-examine the world of work, with regard to: (a) its educational and training institutions; (b) learning processes and necessary competencies; (c) its effects upon labour markets; (d) school-to-work transitions; (e) the role of gender; (f) principles of equality and equity; (g) the roles of government, business and industry; (h) the dominant didactics for learning a profession; (i) the assessment of competencies; (j) the effects of flexible pathways and curriculum systems; (k) the relationship between human capital formation and TVET systems—among other features of the field. These are some aspects of the TVET field that need to be examined and documented in order to provide the best answers and best practices to improve TVET, and bridge the gap between vocational and academic education in the twenty-first century. It is hoped that this *Handbook* will fulfil this role.

In developing the structure and content of this *Handbook*, the intention of the editors has been to review developments that have occurred in the field of technical and vocational education and training that contribute to the improvement of the field. The *Handbook* is intended to reflect best and innovative practices concerning research, policy and practice affecting TVET and education for the world of work and, wherever possible, concrete case studies have been used as examples. The authors who have contributed to the *Handbook* are representative of the various regions of the world and of major international organizations involved in TVET. In addition, the editors chose to balance contributions by academic authors with those by practitioners, who have often not been able to participate in these discussions in the past.

The audiences for which the *Handbook* is designed include policy-makers, practitioners, administrators, planners, researchers, teachers, teacher educators, students and colleagues in a range of fields who are interested in learning about TVET, in both developed and developing countries, countries in transition and countries in post-conflict situations. The editors appreciate that this has been a tall order given the enormous variations that exist worldwide in the structure and functioning of economies, systems of production and of underlying education systems.

For example, one of the things that the World Bank learned in its work on TVET more than ten years ago was that OECD models introduced into Africa did not work because they were too expensive and could not link up with local labour markets (which were mostly located in the informal sector). Some studies have explored the *transfer* of TVET models from developed to developing nations and the difficulties encountered which hindered successful transfers.

A recent World Bank study of TVET in Sub-Saharan Africa reinforces this view, and documents the central role of employer training, which is in contrast to the high

performing Asian countries where well-managed and well-financed formal TVET institutions have on the whole been effective.

In the light of such evidence, the purpose of the *Handbook* will be to provide information on different models of TVET that occur in different parts of the world, while not suggesting that such models are necessarily easily transferable or appropriate for countries at different levels of development and with different cultural and socio-political backgrounds.

Notes

1. The material in this section of the chapter draws upon ‘Vocational education: the come-back?’, in *Education today* (UNESCO, 2005) to which the authors of this chapter, and UNEVOC, made major contributions.
2. <www.stratrealfoundation.org/>
3. It could be speculated that Della Vos may have been the descendent of one of the trades/craftspersons brought to modernize Russia in the late 1600s by Peter the Great.

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Prologue

Skills Development in the Informal Sector of Sub-Saharan Africa

Arvil V. Adams

1 Introduction

Since first recognized in the early 1970s, the informal sector of Sub-Saharan Africa has become a growing source of employment for large numbers of youth, but also for older workers pursuing entrepreneurial goals and others adjusting to structural changes in the region's employment (Bangasser, 2000; Liimatainen, 2002; International Labour Organization [ILO], 2002a; Johanson & Adams, 2004; Becker, 2004; Haan, 2006; Fox and Gaal, 2008). Initially viewed as a safety net for those unable to find employment in the modern sector, the image of the informal sector has begun to change with time and the education of those entering it. More workers have begun to view it not as a temporary stop while searching for employment in the formal wage economy, but as a preferred destination offering opportunities to those wanting to become entrepreneurs.

In countries throughout the Africa region, where job growth in the formal wage sector has stagnated making it difficult to absorb rising numbers of new entrants to the labour force, self-employment has opened opportunities for youths who are acquiring higher levels of education and skills (Fox and Gaal, 2008). Rising levels of education are producing higher earnings in the informal sector. In Ghana, using household data from the 2005 Ghana Living Standards Survey, the comparison of earning gains estimated with multiple regression analysis showed returns by level of schooling for self-employed workers in the urban non-agriculture sector that approach or match those of wage workers in the urban non-agriculture sector (World Bank, 2008).

A cursory look at countries in Sub-Saharan Africa shows that informal sector activities maintain a significant and, in some cases, dominant share of their respective markets covering mining, manufacturing, commerce, finance and other sectors. Examples of this employment are seen on the streets and in home-based activities in countries like Nigeria, Kenya and Senegal in the vending of food and small merchandise, in health care by traditional healers, the tailoring of garments, and the manufacturing of furniture and repair of automobiles. The size of the sector, estimated to account on average for 42% of gross domestic product (GDP) in twenty-three African countries in 2000, is forcing governments to acknowledge its

existence and importance to the national economy and the welfare of those employed therein (Schneider, 2002). In South Africa, with a larger formal sector, the informal economy still contributes between 7 and 12% of GDP (Devey, Skinner and Valodia, 2006).

Confronted with evidence of the informal sector's growing importance, this prologue examines the question of how workers are prepared with skills for these jobs and how governments are encouraging further investments in skills alongside a menu of other interventions that would raise productivity and earnings in the sector. It looks closely at the unique character of skills development in the sector and the roles played by schools and employers as providers of skills. Unlike the formal sector where workers may be specialized, those working in the informal sector must have skills to perform multiple functions and few can afford long spells away from work for training. These features set skills development for the informal sector apart from that for the formal sector.

The chapter examines recent research covering measurement of employment in the informal sector, impediments to investing in skills within the sector, and policies and programmes to expand this investment. It extends earlier work on this topic carried out under the auspices of the World Bank (Johanson & Adams, 2004). The purpose is to examine what is currently known about these issues, identify gaps in knowledge, and offer a strategy for expanding skills development in the informal sector. Recent research, for example, like that mentioned above in Ghana showing the changing character of employment in the informal sector and the prospects of growing returns to skills, casts a new light on employment in this sector. Further inquiry into the robustness of these findings is merited in other countries to deepen our understanding of how skills influence the welfare of those who create their own employment in the informal sector and how investment in skills can be expanded.

While recognizing informality in the economy and the importance of skills to the earnings of those employed in the sector, the chapter does not address incentives for this informality or suggest ways in which the informal economy might be formalized. The chapter does attempt, however, to unravel differences in the informal sector as a means to better understand how the welfare of those employed in the informal sector can be improved through investments in their skills. It provides a framework of questions for further study to meet this challenge. Finding ways in which to improve the working condition of those employed in the informal sector is part of a broader agenda defined for promoting decent work in the global economy (ILO, 2002b).

2 Measuring the Informal Sector

The ILO first introduced a statistical definition for the informal sector in a January 1993 Resolution adopted by the fifteenth Conference of International Labour Statisticians (ILO, 2002a). The attention paid to the measurement issue was generated by interest in the size of the informal sector and its contribution to national in-

come and economic welfare. A decade later, this interest has grown to include the increasingly precarious nature of employment in the formal sector, joining that in the informal sector, as previously secure jobs and benefits were being threatened by growing global competition. The result has been an effort to derive a broader definition of informal employment. This was reflected in a subsequent Resolution adopted in December 2003 by the seventeenth Conference of International Labour Statisticians (Husmanns, 2004). Interest in the two concepts—*employment in the informal sector* and *informal employment*—has driven efforts to define and measure the informal economy.

2.1 The Conceptual Framework

Just how are these concepts defined? The conceptual framework adopted in defining *employment in the informal sector* and *informal employment* uses a building-block approach that disaggregates total employment along two dimensions: type of job and type of enterprise. Labour-force surveys have been a primary source of data for measuring informal sector employment and informal employment. These surveys are conducted on a regular basis in most countries and are used to produce data on the two concepts by adding additional questions pertaining to the informal sector and informal employment (Husmanns, 2004). Household surveys identify informal production units and then administer ‘enterprise’ modules as part of the household survey, thus adopting a mixed household and enterprise survey approach to measurement of employment in the informal economy. The two-step mixed survey approach is considered superior in coverage to using separate household or enterprise surveys (Roubaud & Razafindrakoto, 2007).

Within the household survey, the type of job held in the informal sector covers the self-employed, own-account workers, contributing family workers, paid workers and members of producers’ co-operatives. In the absence of an enterprise module, the self-employed, own-account and contributing family workers are sometimes used as a proxy for informal sector employment. Where an enterprise module is used, informal sector enterprises are defined as unincorporated private production units owned by individuals or households producing at least some non-agricultural goods or services for sale or barter. Their size in terms of employment is below a certain number threshold determined by national circumstances, but often defined as under ten workers. These enterprises are not registered under specific forms of national legislation and may be separated into production activities that are legal, legal but underground or illegal.

Informal employment can also be found outside the informal sector and includes unpaid family workers, workers with precarious employment in formal sector enterprises, and certain employment in households producing goods exclusively for their own use or employing paid domestic workers. The sum of employment in informal sector enterprises and that outside in these three categories defines informal employment. For an illustration of the building-block approach to measurement of formal and informal sector employment and also informal employment see Fig. 1.

Production units by type	Jobs by status in employment							
	Own-account workers		Employers		Contributing family workers		Employees	
	Informal	Formal	Informal	Formal	Informal	Formal	Informal	Formal
Formal sector enterprises					1		2	
Informal sector enterprises ^(a)	3		4		5		6	7
Households ^(b)	9						10	

- (a) As defined by the Fifteenth International Conference of Labour Statisticians (excluding households employing paid domestic workers).
 (b) Households producing goods exclusively for their own final use and households employing paid domestic workers.

Note: Cells shaded in dark grey refer to jobs, which, by definition, do not exist in the type of production unit in question. Cells shaded in light grey refer to formal jobs. Un-shaded cells represent the various types of informal jobs.

Informal employment: Cells 1 to 6 and 8 to 10.

Employment in the informal sector: Cells 3 to 8.

Informal employment outside the informal sector: Cells 1, 2, 9 and 10.

Fig. 1 Conceptual framework: informal employment
 Source: Roubaud & Razafindrakoto, 2007.

While the study of employment in the informal sector is important for capturing the contribution of this sector to national income and welfare, the separate study of *informal employment*, going beyond the informal sector, has attracted the attention of policy-makers concerned with the increasing precariousness of employment in all enterprises. The ILO has expanded its traditional attention on employment in the informal sector to include informal employment as part of its ‘decent jobs’ agenda.

Preceding the interest of the seventeenth Conference of International Labour Statisticians in the informalization of employment, the ILO set out to measure employment in the informal sector leading to the publication in 2002 of the *ILO compendium of official statistics on employment in the informal sector*. The 1993 ILO Resolution on employment in the informal sector provided national statistical agencies with a degree of flexibility in their definition of the informal sector and this produced problems in international comparability. Following recommendations by the Expert Group on Informal Statistics (the Delhi Group), a set of recommendations was offered in 1999 for the harmonization of national definitions (ILO, 2002a). The 2002 *ILO compendium* contains harmonized measures of informal employment, but for only seven countries globally, while also reporting measures based on national definitions for another thirty-eight countries.¹ Only one of the harmonized country reports—Ethiopia—is from Sub-Saharan Africa.

While there is a growing awareness of the informal sector by governments and its importance to national accounts and measures of economic activity and well-being, national statistics capturing the concept continue to vary from country to country. These differences are attributed to:

- Criteria used to define the informal sector, for example, employment size of the enterprise, use of registration status;
- Branches of economic activity covered, particularly concerning the inclusion or exclusion of agricultural activity;
- Inclusion or exclusion of paid domestic employees employed by households or producers of goods for their own final use within their households;
- Inclusion or exclusion of persons with a secondary job in the informal sector;
- Inclusion or exclusion of persons engaged in professional or technical activities: and
- Geographic coverage, some for urban areas only.

Caution, therefore, has to be exercised in making cross-country comparisons of published informal sector data. Careful attention must be given to the concepts and methodology used in each country in national statistics for the informal sector. One of the lessons drawn from this for further study of the informal sector is the importance of benchmarking the definition and methods used by a country’s national statistics agency, and if special surveys are undertaken, using the ILO’s building-block approach to define carefully the concept used in each country in order to harmonize definitions for comparison or to understand their differences. While recognizing the importance of informal employment outside the informal sector, this chapter is largely focused on issues of employment in the informal sector and the skilling of its workforce. It does not address skills in the formal wage sector.²

2.2 A Profile of Informal Sector Employment

The ILO's 2002 report provides a glimpse of those employed in the informal sector. Table 1, drawn from the ILO report, presents informal sector employment using national definitions for countries reporting from Sub-Saharan Africa. The variation in this table of the percentage employed in the informal sector reflects the differences in national definitions. The share of informal sector employment varies from nearly 20% in Botswana to over 90% in Mali where agricultural employment is included in the national definition. Though not reported here, the share of informal employment in rural areas tends to exceed that in urban areas. Considerable churning of employment in the informal sector is noted in South Africa by Devey, Skinner and Valodia (2006) with slightly over 44% of those employed in the informal sector in September 2003 continuing to work in the informal sector in March 2004.

Table 1 Persons employed in the informal sector: selected countries in Sub-Saharan Africa (latest available year)

		Employment ('000)			Employment as a percentage		
	Year	Total	Men	Women	Total	Men	Women
National definition							
Botswana	1996	60.5	21.1	39.4	19.3	12.3	27.6
Benin*	1999	275.5	174.8	100.7	46	50	41
Cameroon*	1993	119			57.3		
Ethiopia	1999	4814.8	1444.2	3370.6	74.2	56.4	85.7
Madagascar*	1995	239			57.5		
Mali	1996	1176.1	485.6	690.2	94.1	91	96.4
South Africa	2001	3319	1572	1746	31	25.7	38.2
Tanzania	1991	2369.4	1531.1	838.3	22	28	15
Small or micro-enterprises (national definition)							
Kenya	1999	1881	1090.4	790.6	36.4	43.9	29.5

Source: ILO, 2002a.

* = urban only.

Self-employed workers, most of whom are own-account workers and unpaid family workers, are considered the major component of the rural and urban informal sectors. Becker (2004) estimates that 70% of the informal sector is comprised of those who are self-employed with the percentage rising to 81% if South Africa is excluded. The number of self-employed in non-agricultural activities, measured by household surveys, has increased over the past two decades. Own-account and family workers represented nearly two-thirds of the non-agricultural labour force in Africa. Women's share of informal employment is higher than that of men's in about half of the countries for which data are available.

Women comprise most of the unpaid family workers and are often undercounted, since many are home-based. Trade accounts for a major share of informal sector employment. From a survey of South Africa, Lund and Skinner (2003) report that informal employment is concentrated in the retail and wholesale trade with just over half of all informal sector workers located in this sector. A significant number

are also employed in construction, manufacturing and services. Over 10% of those engaged in the informal sector have jobs in manufacturing and this is considered low in comparison with other developing countries. Haan (2006) reports that trade activities, including street vending and ambulant trading, are the most important segments of the informal sector in Africa, usually constituting half and sometimes up to 75% of employment.

The self-employed dominate employment in the informal sector. In a survey of the characteristics of informal sector enterprises in Botswana, Kenya, Malawi and Zimbabwe, Mead and Liedholm contend that on average almost two-thirds of all informal sector enterprises are one-person businesses (quoted in Haan, 2006). Most of these enterprises are labelled as subsistence level firms with only a small likelihood of growing into larger enterprises. Earnings and profits in these small enterprises are low by comparison with larger enterprises that hire other workers. These small enterprises are sometimes referred to as the 'working poor'.³

Still, evidence from a number of countries confirms that average incomes in the informal sector are generally higher than official minimum incomes and earnings from agriculture. Earnings of self-employed non-agricultural workers in Ghana in 2005, a proxy for informal sector workers, were 35% higher than those for self-employed agriculture workers (World Bank, 2008). Fox and Gaal (2008) conclude that earnings in the informal sector pull workers out of agriculture with average incomes in the informal sector of most countries being at least 50% higher than those in agriculture. The impact on poverty, they report, is positive with data from a number of countries showing that households whose main economic activity is in the informal sector have a lower rate of poverty—the highest poverty rates are always in agriculture. Having a family member earn income in the informal sector raises household incomes.

The education levels of those employed in the informal sector are generally lower than those in the formal sector (Liimatainen, 2002). However, this pattern is changing as young workers are entering with more education. Low education levels limit trainability and lead to modest skill levels. In a survey of five African countries—Kenya, Senegal, Tanzania, Zambia and Zimbabwe—Haan (2006) reports that about half of informal sector workers have either no education or primary education, and less than 5% have a post-secondary education. Slightly better results are reported by Walther (2006) for South Africa. In contrast, a survey of those employed in the informal sector of Nigeria found larger numbers with a post-secondary education (14%), and some 45% with a secondary school certificate (NISER, 2007). Finding ways to continue education and promote skills training forms an important challenge to improving productivity in the informal sector and reducing poverty.

3 Building a Skilled Workforce in the Informal Sector

Skills for work are acquired in different settings in classrooms, workshops and on the job. They are provided by public education and training institutions, private for-profit and non-profit institutions, and employers through training in the workplace and outside. Training may be taken to qualify for employment or to upgrade skills

and prepare for the introduction of new technology in production. For those working in the informal sector, some or all of these approaches to skills may be used. Public and private schools can play an important role in preparing individuals for creating their own employment by providing them with a technical skill, usually through a technical and vocational education curriculum. A commonly used approach to self-employment is working for another employer and acquiring skills on the job, either informally or through an apprenticeship, before leaving to set up one's own business. Each approach has strengths and weaknesses.

3.1 Public Technical and Vocational Education and Training

Public secondary and tertiary schools with technical and vocational education programmes have played a smaller role than might have been anticipated in preparing workers for informal sector employment (Atchoarena & Delluc, 2001).⁴ Originally developed at the time of independence in the 1960s to meet the expected skill requirements of industrialization, these institutions have been slow to respond to the structural change and growth of the informal sector (Brewer, 2004; Haan, 2006; Liimatainen, 2002; NISER, 2007; Filipiak, 2007). Structural adjustment programmes and tight government budgets contributed in the 1980s and 1990s to deteriorating facilities and equipment and the inability of these institutions to update programmes and respond to the shift to informal sector employment (ILO, 2002b; Johanson & Adams, 2004).

Other impediments also stand in the way of the public sector's response to meeting the skills challenge of the informal sector. The training offered by the public sector is considered theoretical in focus without sufficient opportunities for practice and biased toward white-collar jobs in the wage sector (Liimatainen, 2002). Entry requirements and fees are often too high and the training methods used better suited to a more literate population. The courses offered are considered rigid and too standardized to meet the multi-skilling needs of the highly diverse informal sector. Where public financing is used without accountability for results, these institutions have few incentives to reflect and adjust to changes in the demand for skills (Ziderman, 2003). Weak accountability influences not only the responsiveness of the public sector to special needs of the informal sector, but in a more general way to the changing demand for skills in the formal sector.

The population targeted for this training and the mode of delivery are also factors behind the failure to reach out to the informal sector with skills. Public technical and vocational education programmes are largely focused on the full-time student preparing for entry into the world of work and require sustained periods of time in school. The focus on pre-service training is not matched by a focus on in-service training for those already employed. This model has proved ill-suited to those among the poor seeking to combine school and work in a part-time fashion to provide families with income and, similarly, to meet the needs of older workers who are unable to afford time away from work to undergo training. A more flexible

approach is needed. Examples of this are found where schools have adopted modular, competency-based curricula that permit flexible entry to and exit from training at hours not interfering with the workday.

The Kenya Jua Kali programme (Kiswahili for ‘work under the hot sun’), offering training vouchers to those working in the informal sector in the mid-1990s, provides an interesting window on the response of public training institutions to the demand for skills that these vouchers created. The vouchers were observed to produce a positive supply response to the demand created for skills, but mainly from non-governmental organizations and from master craftspersons in the informal sector. New programmes were developed tailored to the needs of voucher recipients and offered during off-hours to fit work schedules. Public institutions showed little interest in adapting their traditional programmes to respond to this new source of demand (Adams, 2001). The motivation for responding to new sources of demand like this with innovative programmes is diminished where public institutions are unable to retain locally-generated income for quality improvements and incentives for instructors.

The recent introduction of entrepreneurship education represents an innovation in public secondary and tertiary education institutions that is relevant to the informal sector. These programmes help develop attitudes favourable to starting one’s own business and provide knowledge and skills for running a business, e.g. business law, accounting and bookkeeping, credit and finance, and marketing.⁵ Farstad (2002) examined entrepreneurship education programmes in secondary and tertiary education institutions in Botswana, Uganda and Kenya. He found instructors generally well qualified, but observed no immediate impact on the numbers of students leaving school to start a business.

The fact that students did not immediately start new businesses is not by itself an indicator of failure on the part of these programmes. Farstad acknowledged that the more traditional route to self-employment starts with an initial period of apprenticeship or wage employment to gain practical experience and build professional self-confidence. In a comparison of graduates of general secondary education programmes and those from technical and vocational education programmes, he observed that the latter group was more likely to start businesses within a few years of graduation. The technical education provided a skill that was then honed on the job with an apprenticeship and wage employment before setting out to start a new business.

Entrepreneurship education has encouraged schools to think outside traditional patterns of pedagogy and classroom instruction. Periods of mandatory work placement have been introduced along with compulsory development of a business plan subject to examination and grading. In Kenya, entrepreneurship education is delivered with the assistance of small business centres attached to all public post-secondary and some private technical and vocational education institutions. In Botswana, students benefited from the requirement that they establish and operate a student enterprise. Co-operation between training institutions and private enterprises in curriculum development and training delivery was found to add value in the three countries studied (Farstad, 2002).

Other options for engaging public education and training institutions in skills development for the informal sector are discussed below in the section on employers and traditional apprenticeships. The low educational background of many of those employed in the informal sector opens opportunities for greater attention of public sector institutions to adult education and literacy programmes, and to the offering of what is becoming known as *second-chance education* tailored to the needs of those who have missed opportunities for early education (World Bank, 2007; Adams et al., 2007). Where found, these programmes have provided low-cost education to open doors for employment, but have not been carefully evaluated for their impact on further training and earnings.

3.2 Private Providers of Skills

While the public sector has been slow to respond to the changes in demand for skills brought about by growth of the informal sector, private institutions have been more responsive to this demand (Brewer, 2004). These institutions are of two types: for-profit and non-profit institutions (Bennell, 1999). The for-profit institutions have grown in numbers in the 1990s with the decreased capacity of public providers (Atchoarena & Esquieu, 2002). While many are registered trainers and follow official curricula and prepare trainees for government trade tests like their public counterparts, a large number are unregistered, small in scale and form part of the informal sector themselves. They appear as storefront operations that can be observed in any African city.

Tuition and training fees constitute the main sources of income for these institutions, although registered institutions may receive subsidies from the government. Largely dependent on fees, for-profit institutions are concentrated in urban districts and less frequently found in rural areas. They are responsive to demands for skills, adjusting quickly to changing needs. The programmes offered often require limited investment in equipment and facilities and provide easy market entry and exit for the providers. Commercial courses are popular, including IT programmes. Other soft courses cover tailoring, driving schools, food preparation, auto repair, cosmetics, etc. Programmes are often of short duration to fit the 'just-in-time' learning needs of trainees.

Fees are kept low, but still are not affordable by the poorest of the poor. Quality varies widely where standards are left to the provider (Johanson & Adams, 2004). Private for-profit providers could play a larger role in the provision of training to those in the informal sector. Their programmes are demand led. Their sometimes modular short courses are well suited to a more flexible delivery of skills training for those who cannot afford long spells away from their work. Expanding their role will require attention to the capital market constraints they face and the incentives needed to encourage more services in rural areas and to the poor. The promotion of private training associations could also open opportunities for co-operation and reduction of costs, while providing a framework for accreditation and quality assurance. Examples of these associations merit further study.

The term non-governmental organization (NGO) generally refers to a range of non-profit organizations that include providers of training (Haan, 2006). Churches and international agencies play an important role in this capacity, along with national and local community-based organizations. NGOs include local branches of strong international NGOs and national NGOs with wide coverage and smaller 'community-based organizations'. Training by larger NGOs is sometimes linked to other support services for small businesses, including micro-credit. Small business incubators, operated by NGOs, often offer entrepreneurs a package of business services, including training, but have not been carefully studied in Africa. Large church-based training NGOs like Don Bosco and secular NGOs like Opportunities Industrialization Centres (OIC) are found in a number of African countries.

Many of the smaller church-based NGOs and community-based organizations maintain a strong social emphasis in their training outreach to the rural poor, minorities, women and the handicapped. Their training activities tend to have social and cultural rather than economic objectives with the result that their training is of limited value in helping participants enter into self-employment (Haan, 2006). They focus training on traditional trades. Curricula are outdated and the training offered is theoretical rather than practical. Quality is low. Services are generally free-of-charge, but with some beginning to charge minimal fees. These NGOs serve the poor, but they offer little that translates into preparation for self-employment.

What Haan (2006) calls 'traditional training NGOs' are larger in size and specialized in skills training. Don Bosco schools are an example. They benefit from international assistance and tend to resemble training provided by the public sector with full-time, centre-based training of long duration directed at wage employment in the formal sector. In many respects they look like modern, better equipped versions of public technical and vocational education schools. The quality of training offered in these traditional training NGOs tends to be better than that found in public institutions, offering more practical experience, but still without a focus on self-employment. These institutions are more likely to reach rural areas and serve the poor. Their financial base, however, is often limited and insecure.

3.3 Enterprise Investment in Skills

Enterprises are a source of demand for and supply of skilled workers. They train and provide needed skills and experience for employees to promote competitiveness and profitability. Some workers who are trained may choose later to take their skills and create their own employment. The training offered by enterprises tends to be short-term in nature and uses the firm's own skilled workers or engages external vendors for its delivery. The training may be offered on-site in the enterprise, such as a typical apprenticeship, or off-site in an institutional setting. The World Bank provides a profile of enterprise training in over 100 countries world-wide through its Investment Climate Assessment (ICA) surveys. In Fig. 2, these surveys show

considerable variation in enterprise training across regions with enterprises in Sub-Saharan Africa being active trainers.

An earlier version of the ICA surveys in Sub-Saharan Africa, the Regional Programme for Enterprise Development (RPED), captured training by enterprises in the mid-1990s and the correlates of this training (Biggs, Shah & Srivastava, 1995). Enterprises found to be active trainers were large in size measured by employment, active exporters, users of technology and beneficiaries of foreign direct investment (Johanson & Adams, 2004). RPED surveys in Kenya, Zimbabwe and Zambia found that the training of workers was selective, with those having higher levels of education more likely to be chosen by the enterprise for training (Nielson, Rosholm & Dabalen, 2007).

Smaller enterprises, especially those with less than ten employees—a proxy for the informal sector—are less likely to train. In Kenya, Zimbabwe and Zambia, only 4.6% of firms with ten or fewer employees trained in comparison with 81% of firms with 151 employees or more (Nielson, Rosholm & Dabalen, 2007). The impact of this training was favourable on the output of enterprises and wages of workers. A 1% increase in the workers trained from the sample average of 9% translated into a 60% increase in value added for all firms and a 99% increase for micro and small enterprises. Training was estimated to increase wages on average by 15–21% (Biggs, Shah & Srivastava, 1995).

The returns to training for micro and small enterprises, noted above, raise the question of why a larger percentage of these firms do not train. A number of factors are offered to explain this pattern. Already observed is the fact that the education

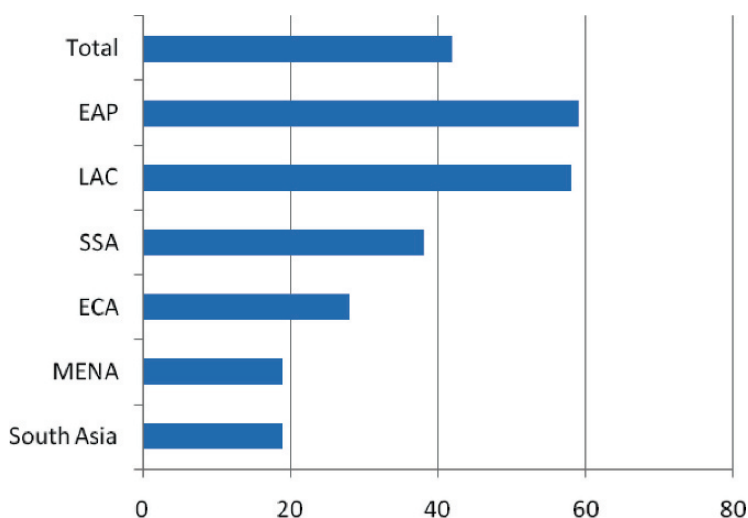


Fig. 2 Enterprises are active trainers world-wide (as a percentage of total training)

EAP = East Asia and the Pacific; LAC = Latin America and the Caribbean; SSA = Sub-Saharan Africa; ECA = Europe and Central Asia; MENA = Middle East and North Africa.

Source: Tan, 2006.

levels of workers in the informal sector are lower than those in the formal sector. With a small number of workers performing a wide range of tasks, multi-skilling is required, which can be expensive. The time away from work by a single worker in a small firm can be costly in foregone output. Small enterprises in the informal sector also face cash flow constraints in paying for training and a lack of professional capacity from human resources officers who can define training needs and design training programmes. For many in smaller firms, there may also be a lack of awareness of the benefits of training.

While each of these factors requires careful consideration, one of the possible solutions to constraints on training comes in the form of support for industry associations (Johanson & Adams, 2004). The formation of industry associations and their engagement in training can offer solutions to a number of the problems above. These associations can promote a greater awareness of the benefits of training among small enterprises, help in defining training needs for members and the design of appropriate training programmes, contribute to economies of scale in the delivery of training, reduce the unit cost to the enterprise, establish training standards for a sector and certify the skills acquired as a means to promote the quality of the training offered. This role is already played by construction associations and many others and could be expanded. There has been little rigorous examination of the effect of these associations on skills development in the informal sector.

3.4 Employers and Traditional Apprenticeship

Traditional apprenticeships are by far the most important source of skills training in Africa for the informal sector, with these apprenticeships concentrated in West and Central Africa (Haan, 2006; Filipiak, 2007). Liimatainen (2002) estimates that up to 70% of urban informal sector workers in Africa have been trained through the traditional apprenticeship system. The Ghana Statistical Service, for example, found 207,000 youths registered as apprentices in 2002, while in this same period a much smaller number of young people, just over 50,000, was enrolled by public and private providers (World Bank, 2008). Traditional apprenticeships in the informal sector consist of private contractual arrangements between a parent or apprentice and a master craftsperson who agrees to provide practical training in the workplace, ranging from several months to three or four years in duration, and subsequently certify the training in return for a fee or reduced earnings while learning.⁶

Traditional apprenticeships are distinguished from other formal apprenticeships registered with a government agency, usually a ministry of labour, and administered by employers and worker organizations. Traditional apprenticeships as individual contracts are self-financing and self-regulating and provide practical, hands-on training with good prospects for employment after the training. At the same time, traditional apprenticeships suffer from the weak level of education of those entering apprenticeships. Few have passed beyond lower secondary education and many will not even have completed primary education. Literacy is an issue. Choices of trades follow gender biases. Master craftspersons, in turn, do not provide theoretical

knowledge alongside practical experience and, more often than not, teach out-dated technologies. Pedagogy varies and there are few market standards available for judging the quality of the training provided (Johanson & Adams, 2004).

These apprenticeships are available in a wide range of trades, mostly in blue-collar occupations, and are a substitute for school-based instruction.⁷ Most trades offered by public and private training institutions can also be mastered through a traditional apprenticeship. The flexibility of apprenticeships in combining work and learning, their affordability and self-financing, their connection with future employment, and their generally lower entry standards make them attractive as a source of skills to disadvantaged youth. Haan (2006) reports that apprenticeships are less evident in Eastern and Southern Africa than in West and Central Africa with youth sometimes described in the former merely as ‘helpers’. Still, in countries like Kenya, Tanzania and Zimbabwe, he finds large numbers of youth who are acquiring skills in informal enterprises under the guidance of a master. In Kenya, available information indicates that some 40–60% of informal sector operators acquire their skills through apprenticeships.

Household data from the Ghana Living Standards Measurement Surveys in 1991/1992 and 2005/2006 provide a profile of changes in apprenticeship over time. Table 2 compares the share of youth aged 15–30 years who have gone through an apprenticeship in each period. The share entering an apprenticeship has been rising for young men and women, but with a higher growth rate for young women. Apprenticeships are more evident in urban than in rural areas. Education levels for youths are rising as a consequence of Ghana’s efforts to provide basic education for all and the share of those following their education with an apprenticeship is also rising at each level of education except post-secondary. While those with a technical or vocational education are likely to acquire their skills in an institutional setting, those with a general education are more likely to pursue skills through an apprenticeship.

Studies of traditional apprenticeship in other African countries could examine the robustness of these patterns. An apprenticeship opens opportunities for employment in the informal sector, but also in other types of employment as seen in Table 2. Those working in the private informal sector as self-employed or wage workers are likely to have acquired their skills through an apprenticeship. Reflecting the growing importance of traditional apprenticeships, 51% of youth in non-agricultural self-employment in 2005 acquired their skills in this manner—a rate twice that of the earlier period. With consumption levels used as a proxy for family income, apprenticeships are accessible to all income groups, but favour those who are better off. Those in the lowest consumption quintile demonstrate much lower rates of participation in apprenticeships.

There is a question of whether traditional apprenticeships should form part of a strategy for skills development in Sub-Saharan Africa. It is doubtful, for example, that small firms in the informal sector acquiring their skilled workers through apprenticeships will contribute in a significant way to the export-led development strategies of many countries. Moreover, the ability to leverage large numbers of apprentices is constrained by the number of skilled craftspersons available. These

Table 2 Share of youth in Ghana (15–30 age group) who have gone through an apprenticeship

	1991/1992			2005/2006		
	Urban	Rural	Total	Urban	Rural	Total
Gender						
Male	36.0	18.1	21.9	46.7	19.0	27.3
Female	21.1	11.1	13.9	40.7	20.1	26.3
Age group						
15–19	10.6	5.2	6.1	30.9	6.9	11.1
20–24	34.5	16.4	20.8	44.3	24.4	31.0
25–30	28.8	21.4	23.7	46.2	24.3	31.9
Education level						
No education	15.1	5.8	7.5	21.4	6.9	8.7
Some primary	16.7	15.9	16.0	42.1	16.6	21.4
Primary	25.4	10.5	13.3	54.1	25.5	32.6
Secondary (lower)	38.5	25.9	29.9	60.4	43.2	50.9
TVET	22.2	12.5	19.2	20.0	19.2	19.8
Secondary (higher)	14.7	13.5	14.3	29.6	17.5	25.7
Post-secondary	13.3	11.1	12.1	7.6	3.4	6.5
Type of employment						
Wage public sector	9.1	12.7	10.8	12.4	10.9	11.9
Wage private sector formal	50.7	56.4	52.7	28.0	42.5	31.6
Wage private sector informal	53.8	57.5	55.2	36.0	49.6	41.2
Self-employed agro, paid	12.2	16.3	16.0	32.2	18.8	19.7
Self-employed agro, unpaid	16.2	7.6	8.4	22.1	8.4	9.2
Self-employed non-agro	27.0	24.2	25.7	56.8	44.1	51.2
Standard of living						
Lowest quintile	12.1	8.4	8.6	30.3	9.4	10.9
Second quintile	6.9	10.3	9.9	36.2	15.2	18.3
Third quintile	25.9	14.0	16.4	35.9	25.1	28.0
Fourth quintile	27.0	17.1	20.3	43.4	31.5	36.7
Highest quintile	31.4	28.4	30.0	49.6	41.3	46.9
All	26.9	14.4	17.5	43.5	19.6	26.8

Source: World Bank, 2008.

considerations aside, improving traditional apprenticeships can contribute in a positive way to employment and poverty reduction. As shown in Table 2 for Ghana, traditional apprenticeships are a source of skills for employment in both the formal and informal sectors. Those employed in the informal sector earn more than those in agriculture and improving their productivity with skills can further contribute to poverty reduction (Fox and Gaal, 2008).

As presently structured, public vocational and technical education programmes appear to have little to offer employment in the informal sector, but this could be changed if public financing for these institutions is instead shifted to focus on outcomes, such as their success in serving target populations of master craftspersons and apprentices, rather than simply financing inputs, i.e. classrooms, courses offered, instructors hired, etc. Performance-based budgeting for public institutions could provide incentives to upgrade technical skills for master craftspersons and

improve the pedagogy they use (Ziderman, 2003). More attention and accountability could be given to these institutions in partnership with traditional apprenticeships for addressing the low levels of basic education that handicap the training of apprentices and master craftspersons and for providing the complementary theoretical training needed to accompany the practical training of apprenticeships.⁸

It is reasonable to question whether emphasis on skills alone will improve the productivity and incomes of those who are employed in the informal sector (ILO, 2000). The improvement of financial services and access to credit are often listed as critical needs in surveys of small businesses, along with secure worksites and access to new technologies and business services (Liimatainen, 2002; Riley & Steel, 2000). NGOs play an important role in the provision of these services to micro, small and medium-sized enterprises, often offering a menu of services alongside training. Working through informal sector employer associations, as already noted, can further assist in organizing services, particularly in skills training, by using their size to reduce the cost of training needs assessments, establish competency standards, develop curricula and certify skills obtained in traditional apprenticeships.

National training authorities (NTAs) in a growing number of countries throughout Sub-Saharan Africa influence training policies and resources for training. Training funds operated under NTAs or independently, as described below, can play a role in providing incentives for NGOs and industry associations to serve the training needs of the informal sector (Ziderman, 2003). In Côte d'Ivoire, the Vocational Training Development Fund helps NGOs organize training for informal sector enterprises (Johanson & Adams, 2004). Chafa (2002) describes the Skills Development Initiative of Malawi's Technical Entrepreneurial Vocational Education and Training Authority (TEVETA) and its efforts to obtain credit in the national training system for skills acquired through training in the informal sector. There are few rigorous evaluations of these programmes available and more attention needs to be given to their impact on apprenticeship. The same can be said for the impact of apprenticeships and other forms of training on employment and earnings.

4 Policies Encouraging Enterprises to Invest in Skills

Government policies to encourage enterprises to invest in skills subsidize the cost of this investment through various measures. The incentives may vary in their impact on the actual amount of training done. Twenty-one countries in Sub-Saharan Africa have introduced training funds financed by payroll taxes, while others, such as in Namibia, have recently proposed such a scheme (Ziderman, 2003). These funds reimburse enterprises for the cost of qualified training undertaken. Training vouchers are also an instrument used by governments and training funds to subsidize the cost of training by enterprises and individuals (Patrinos, 2002). Offered to master craftspersons and workers in the informal sector, vouchers can help pay for training

selected by the worker. The cost of training is also subsidized by governments by allowing enterprises to deduct eligible training costs from their income for tax purposes or providing tax credits for qualified training expenses.

The introduction of training levies on payrolls is used globally to mobilize additional resources for skills development (Ziderman, 2003). The fairness of the levy is judged on the taxation principle that those who benefit from the resources spent on training should be those who pay. Payroll levies have been used to finance the provision of training by national training organizations, as is found in Latin America in such countries as Brazil, Colombia and Venezuela, but also training directly by enterprises where a levy-grant system is adopted and administered through a training fund. Enterprises are reimbursed in a levy-grant system for the cost of qualified training expenditures by these funds. This is the dominant model found in Sub-Saharan Africa.

The impact of these funds on training in the informal sector, however, is limited. Most funds exempt smaller enterprises (below fifty employees) from the payment of a levy because of the higher administrative cost of enforcing compliance on the part of these enterprises. Dar, Canagarajah & Murphy (2003), in a review of international experience with training funds, found that small employers do not benefit substantially from these schemes. The financial incentives offered are insufficient to offset the other factors mentioned earlier that deter training by small enterprises. As a result, training funds with levy-grant schemes tend to favour larger enterprises, particularly the training of more highly educated and skilled workers in these enterprises.⁹

There are exceptions, however, as found in Malaysia and Singapore. Both countries recognized the low participation on the part of small enterprises in their levy-grant funds and set out to address the problem. Among the solutions offered were subsidies for conducting training needs assessments, pre-approved training courses not requiring costly application and justification, and the use of excess training capacity of large enterprise by smaller firms. Singapore offered training vouchers to enterprises with less than fifty employees that could be used to pay up-front training costs to ease cash flow problems. The vouchers helped Singapore's Skills Development Fund reach 65% of enterprises with ten to forty-nine workers and 14% of those with fewer than ten workers (Hirosato, 1997). Limited evidence is available in Sub-Saharan Africa on the initiatives of national training funds to reach small enterprises in the informal sector.

Other voucher programmes have been introduced to encourage training in the informal sector (Johanson & Adams, 2004). The Kenya Jua Kali voucher programme, described earlier, was successful in its pilot stage in expanding the supply of training to workers in the informal sector and lowering cost. There was evidence of its positive impact on the earnings of participants and strengthening of the capacity of local Jua Kali Associations responsible for distribution of the vouchers, but problems were encountered with corruption in scaling up that led to high administration costs (Adams, 2001; Riley & Steel, 2000). A similar voucher programme targeting informal sector enterprises was offered in Ghana in the early 1990s that largely failed due to lack of attention in the design to the marketing and distribution of the

vouchers (Johanson & Adams, 2004). The role of vouchers in training is an area that merits further study in Sub-Saharan Africa.

Worldwide, countries allow enterprises to deduct the cost of training from their income as a cost of business before taxes, but for the informal sector where small enterprises may not earn sufficient income to pay taxes or may avoid taxes altogether by not being registered, these deductions provide a limited incentive for training. The same result may apply to tax credits that are targeted to selected enterprises in return for agreed training and employment actions. Where the credit can be refunded to the enterprise in the absence of a tax liability, this may serve as an added incentive for training and even registration of the enterprise, but once again may not be sufficient to prompt small enterprises in the informal sector to train. As a general conclusion, the impact of these various financial incentives on training is not well documented for enterprises in the informal sector.

5 Moving the Skills Agenda Forward

Employment in the informal sector is now an important feature on the landscape of Africa, accounting for a significant share of GDP and influencing the well-being of a growing number of households. Its character has changed ever so slightly as growing numbers of those who now enter this employment do so with higher levels of education than those before them and with entrepreneurial aspirations that look at this employment as a preferred destination for their future, rather than merely a staging ground in the on-going search for wage employment in the modern sector. Capturing the scale and characteristics of informal employment and its contribution to national welfare and poverty reduction is a first step for many countries in defining policies that can promote gains in productivity and incomes in this sector. Among these policies are ones that would improve the skills of those employed in this sector.

5.1 Elements of a Strategy

A strategy based on what is known about the informal sector for improving skills as a means to promote its growth and productivity and improve the incomes of those employed in the sector needs to include the following:

- Acknowledging the existence of the informal sector for policy;
- Raising the educational and literacy levels of those employed therein;
- Recognizing the complementarity of training with other small business services;
- Promoting sustainable financing for skills development;
- Strengthening traditional apprenticeships;
- Defining a role for public providers of skills;
- Building the capacity of industry associations;
- Monitoring and evaluating outcomes for skills development.

The informal sector has emerged as a reality and has to be recognized for policy purposes. How it is treated by governments will probably influence its future as an instrument for employment and poverty reduction. Forcing compliance with the regulations and imposing the taxation of an industrial economy through stronger enforcement measures is likely to drive it further underground or out of existence altogether. Finding the right balance of regulation and taxation that recognizes the higher risk and costs associated with operating a small business and providing the incentives for expansion and formalization of its activities forms a challenge for governments. Looking for ways in which government policy can support skills development in the informal sector is one way to promote the growth of small businesses and improvements in household welfare.

The low education level of many of those employed in the informal sector impedes the upgrading of their skills and their capacity for absorbing new technologies. Policies that promote adult education and literacy and that offer second-chance education programmes enabling youth and adults to acquire non-formal education, recognized as equivalent to the basic education offered by traditional education, can open up opportunities and incentives for further investments in skills by workers and enterprises (World Bank, 2007). Investments in skills, as noted earlier, are part of a menu of services that are needed by small businesses, along with opening access to credit and business services (ILO, 2000). Policies that open credit markets and clear the way for non-governmental organizations to form and deliver these services along with training can create a more favourable investment climate for enterprises in the informal sector.

As suggested above, countries with training funds can adopt new approaches like those used in Malaysia and Singapore that remove the barriers to investment in skills faced by small businesses. At the same time, public expenditures on skills development can be more effectively targeted through vouchers and tax credits to improve the incentives for investments in skills by informal sector enterprises. Cost-sharing is possible through these instruments. The Kenya Jua Kali programme, for example, shows how these targeted expenditures can be expanded to subsidize and improve the access of small businesses to technology and other business services, and also that these businesses are willing to share the costs (Riley & Steel, 2000). Traditional apprenticeships are observed to be a solution for skills development that works well in the informal sector, but there are steps described earlier that can be taken to improve the outcomes of this training without destroying what already works well.

There are roles that can be successfully played by public education and training institutions to serve the informal sector, if financial incentives are in place to encourage this. Emphasis on adult education and literacy programmes are part of this process. The introduction of education equivalency programmes—so-called second-chance education—is designed for those who have left traditional education and are unlikely to return to this learning environment, but can be reached through non-formal programmes of education. There are many examples of this in Latin America, but fewer in Sub-Saharan Africa. Public technical and vocational education through reforms adopting modular, competency-based curricula delivered in

a more flexible timeframe can teach students basic theories underlying a trade to complement the practical skills taught by master craftspersons in traditional apprenticeships.

Industry associations serving the informal sector are prevalent in many countries throughout Sub-Saharan Africa. Strengthening these associations so as to play a more active role in advocating skills development by members, defining training needs, designing and delivering short-courses, and engaging employers in setting competency standards and skills certification, including those for apprenticeships, can help address many of the issues that impede the investment of small enterprises in skills. Skill certification may also be undertaken as part of national qualifications frameworks and extended to cover apprenticeships (Johanson & Adams, 2004). These are some of the elements of a skills strategy suggested by this review of how skills are acquired for the informal sector. Refinement of this strategy and policies supporting skills development for the informal sector need to be informed by regular monitoring and rigorous evaluation of programmes.

There are interventions that do not seem to work well for further skills development in the informal sector. Among them, training funds that are expected to promote training carried out by enterprises show limited evidence of this as far as small businesses are concerned. As suggested, there are tools that these funds could use to encourage training by small enterprises, but examples in Sub-Saharan Africa are largely absent. Treating training expenses as a tax deduction offers an incentive for training in larger enterprises, but this policy is unlikely to have an effect on training in smaller enterprises that operate at the subsistence level and pay hardly any taxes. Tax credits may in turn be a more effective tool for smaller enterprises in the informal sector. Smaller NGOs focusing on social and cultural skills rather than economic ones do little to help beneficiaries create new employment. Finally, public vocational and technical education that remains rigidly focused on skills for the formal sector at a time when this employment is stagnating provides little benefit to those who must find their employment in the informal sector.

5.2 The Role of Government

This chapter has reviewed the sources of skills development in the informal sector along with their strengths, weaknesses and opportunities for improvement. It has highlighted questions along the way where more research is needed to deepen our knowledge of skills in the informal sector. An over-riding theme of the review is the need for more data and information on the informal sector and its participants, particularly how the numbers and characteristics of those employed in this sector are changing with time and the factors affecting these patterns. From this review, it has been possible to sketch the elements of a strategy for moving the skills agenda forward for the informal sector. Fully developing the strategy, however, will require filling many of the knowledge gaps that remain around employment and skills development in the informal sector and adding to our confidence in other findings offered by a small number of countries.

What can governments do as part of this strategy? While governments need to promote a more friendly investment climate for those who create their own employment, where skills are concerned their role in policy development and reforms to promote a more equitable, market-responsive training system for all is of greater importance than initiatives to provide or finance training for the informal sector. Policies that open the market to private providers, including NGOs, are important to expanding access to skills and reducing demands for public expenditure. Policies that provide information to the market about the skill requirements of jobs available and the quality and relevance of training offered by different providers can lead to a more efficient allocation of public and private spending on training. Policies that promote competition in delivery and financing and enforce accountability among providers can together improve training outcomes and lower costs. These actions by government serve the interest of all workers, not just those in the informal sector.

Notes

1. The ILO (2002a) reports that more than sixty countries have started to collect and publish data on employment and other characteristics of the informal sector.
2. For a review of skills in the formal sector of Sub-Saharan Africa, see Johanson & Adams (2004).
3. Bennell (1999) distinguishes between what he calls 'survival' enterprises and enterprises with 'growth potential'. He argues that the former require few skills and therefore it is difficult to see how 'conventional training services could significantly increase productivity and incomes'.
4. In a study of the informal sector in seven African countries, Filipiak (2007) estimates that on-the-job training, self-training, and traditional apprenticeships account for 95% of training in the informal sector. Senegal, for example, has some 400,000 youth in apprenticeships compared with 7,000 in technical and vocational education and training. Monk, Sandefur and Teal (2007) in Ghana, using a household survey, found that 80% of training is acquired through on-the-job training and traditional apprenticeships.
5. While curricula for entrepreneurship education are often locally developed, other packages have been developed and tested by donors, e.g. ILO's *Start/improve your business* and GTZ's *Competency-based economies through formation of enterprises* (Haan, 2006).
6. Haan and Serriere (2002) estimate that fees for traditional apprenticeships average about US\$70 per year. The ILO in 2006 estimated fees to average US\$160, ranging from US\$22 to US\$616. In 2005, Palmer (2007) estimated the average apprenticeship fee in the Ashanti Region of Ghana to be US\$42 with a range from \$13 to \$173.
7. In South Africa a new learnership scheme has been adopted to broaden the present apprenticeship system beyond traditional blue-collar trades to include white-collar occupations in the service sector, as well as the informal sector (Gill, Fluitman & Dar, 2000).
8. The German dual system training provides an example where this complementarity has been achieved, but it has proved difficult to accomplish in other settings where the roles and responsibilities of the public sector and employers for skills development are not defined in this fashion.
9. Given the tendency noted earlier for large enterprises to train without subsidies, training funds are subject to criticism for their high deadweight effects. That is, the funds pay firms to train who would have trained without the subsidy. At the same time, these funds correct for a 'free rider' problem that transfers the cost of training more evenly across firms of all sizes and types.

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International Handbook of Education for the Changing World of Work

Bridging Academic and Vocational Learning



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Bridging Academic and Vocational Learning



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International Handbook of Education for the Changing World of Work

Bridging Academic and Vocational Learning



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International Handbook of Education for the Changing World of Work

Bridging Academic and Vocational Learning



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International Handbook of Education for the Changing World of Work

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International Handbook of Education for the Changing World of Work

Bridging Academic and Vocational Learning



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