



Research for TVET Policy Development

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Preface

Following the UNESCO-UNEVOC International Meeting on "Innovation and Excellence in TVET Teacher and Trainer Education" at Hangzhou/China on November 8 – 10th, 2004, the Chinese Ministry of Education through Tianjin University, UNESCO-UNEVOC and the German government, through InWEnt, jointly organized a follow-up conference on "Development and Implementation of a Master Degree Standard for Teacher and Trainer Education in Technical and Vocational Education and Training (TVET) in East and South East Asia". The conference took place at Tianjin/China on December 9th and 10th, 2005, and was attended by more than 80 participants from ten countries, most of them from East and South East Asia.

The conference sought to contribute to the UN's Millenium Development Goals by discussing strategies to develop a Masters Degree Framework for teacher and trainer education and training in TVET. More than 30 presentations were made at the conference, which can be grouped into the following clusters:

- National case reports on institutional features of TVET teacher education;
- Analytic presentations concerning the conditions of TVET teacher education in different countries;
- The potential of virtual learning/electronic learning in support of TVET and teacher education for TVET;
- Development of international networking and cooperation in TVET teacher training; and
- Necessary accompanying measures with regard to up-to-date scientific developments and the impact of TVET practice.

The conference proceedings and outcomes have been documented by InWEnt and UNEVOC in a conference report, including a number of selected presentations. Following the wishes of many participants Professor Jon Lauglo's presentation on "Research for TVET policy development" is being published as a separate paper. The following text is a revised version of the manuscript prepared by Professor Lauglo for the conference at Tianjin/China in December 2005.

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Research for TVET Policy Development¹

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Abstract

The paper points to questions which the author thinks research could address in order to provide guidance to the formulation of national development of policy on Technical and Vocational Education and Training (TVET). The questions are derived from what the author sees as frequently "talked about" issues in international policy debate on TVET. Research is used in a wide sense—not merely "academic" research. The issues includes: labour market monitoring, keeping abreast of technology, national training authorities, national training funds, national qualifications frameworks, financing, private institutions, modularization of curricula, human resource development, coping with management complexity, inducing industry to do more training, dual systems of basic TVET, low dosage TVET in mainstream secondary schools, TVET for illiterate and semi-literate adults, and indicators of performance that relate to effectiveness, equity, cost and efficiency. Especially in the early stages of policy formulation, research on such matters can provide relevant knowledge when major reorganization of TVET is considered by a country.

¹ This paper is a revised version of a manuscript first prepared by invitation from the Government of the People's Republic of China through Tianjin University, and with sponsorship by the German agency InWent (the Magdeburg office). It was presented at an international conference at Tianjin, China, on 9th-10th December 2005 which was organized in partnership between Tianjin University, InWent, and UNEVOC.

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Research on TVET policy making

What questions could be addressed by research (in the wide sense) in order to assist the development of national policies on Technical and Vocational Education and Training (TVET)? The specifics will much depend on the national context. However, I shall attempt a sketch of research questions which may have some general relevance for what I see as current trends and issues in international policy discussion on TVET.

Policy studies are a wide field that also is much concerned with the sources of policy, and the process of policy formulation, asking in particular: "Who exerts influence?" and "Who benefits"? The field also includes empirical studies of the role that research could play and actually does play in decisions on complex social issues.³ I shall here address a narrower set of questions, with regard to TVET: What knowledge might be useful for decisions when policy makers weigh options and choose among them?

I do not start from some social-engineering perspective that would reduce complex policy choices to matters of technocratic expertise guided by "science". Research has a more limited part to play and cannot replace the need for "judgement" in the face of much uncertainty. Nor can it replace constraints on what options are politically acceptable. Nor can it tell us what values are most important as lodestars for policy. But research can play a role in reducing the range of uncertainty and in building stronger support for some options while weakening the grounds for others. Once decisions are taken and policy is being implemented, research can also play a role in adjusting the course by evaluating implementation and assessing the impact of new policy.

I shall inevitably point to "questions for research" to which answers often are wanting. As with much else in social science, the answers which exist in some studies are not definitive, but evolving, and there are areas of research in which controversies are common, with research used in support of arguments on "both sides". A prime example is policies which give more play to the market mechanism

³ There is a literature on this. I would recommend as an opener to that literature: Charles E. Lindblom (2000) *Inquiry and Change*.

The troubled attempt to understand and change society. New Haven: Yale University Press.

in education. But in any country where policy makers are considering the need for radical restructuring of TVET, there is a clear need for policy making to be informed by research on these matters, and such research should also show cognizance of the controversies which exist.

It is recognized that it may be beyond the capacity of the TVET researchers in any one country quickly to address a wide range of the kind of issues suggested below, if an updated "state of the arts" assessment is requested for policy formulation of TVET. But the agenda of issues and questions is not beyond the capacity of what international agencies can address, especially with select regard to **countries which are trying out new institutional models**. They should do more to review research on what emerges as items of interest for the global agenda, commission studies in countries trying out innovations in TVET, and support international networks of research on TVET.

In addition to the questions which will be raised below, which mostly concern addressing relationships between TVET, resource requirements and results, there will for policy development in any country be a need for basic descriptive statistics about location and capacity of different types of TVET provisions. These are usually available for public provisions (but often not for private provisions and industry based training).

Terms

I use research in a broad sense to include enquiry that is empirical and systematic. **Empirical** means to me a deliberately staged confrontation with sources of information. **Systematic** refers to procedures which seek information in a planned way and which use techniques to guard against error. **"Enquiry"** simply means that one seeks to find out what is unknown. Research needs a rationale to give it a clear focus and to provide reasons why this focus is important. If research is to be policy

relevant, its focus and rationale must address matters which are relevant for policy decisions.

TVET refers to deliberate interventions to bring about learning which would make people more productive (or simply adequately productive) in designated areas of economic activity (e.g., economic sectors, occupations, specific work tasks). This is the distinctive purpose of TVET. However, TVET will also have other purposes which are not unique to TVET, and which also apply to other forms of education, e.g., knowledge, skills, insights and mindsets which are deemed to be generally valuable for the learners, not only in designated areas of economic activity. Such "other" aims will be especially pertinent for longer and full time courses for youth—in contrast to short and episodic training events (e.g., for persons already at work in the occupations concerned). TVET also needs to be conducted according to general social norms about how learners and people in general are to be treated by institutions, e.g., that persons be treated with respect. Thus, "work productivity" is not the **only** aim and concern of TVET, but it is its distinctive objective which sets it apart from other forms of education and training.⁴

There are also learning outcomes which may not be stressed in TVET any more than in programmes of general education but which nonetheless are of great economic importance (e.g., a literate and numerate workforce, readiness to take responsibility and initiative, and to learn new tasks). Thus, there is no need to assume that TVET is the only form of education which matters for performance in the workplace. In fact, in a rapidly changing society and economy, general education will of course be very important across economic sectors and for other important purposes than economic production; and there may be mindsets and norms of great importance for productivity which usually are acquired in other socialization arenas than schools and training centers (e.g., entrepreneurship, drive, reliability, honesty, endurance etc). **Policy** refers to a set of relatively stable goals, and choice of a strategy to reach these goals over a considerable period of time. For national policies for TVET the key goal will be improved productivity of the workforce. Holistic TVET policies will necessarily

⁴ I see "education" as all forms of deliberate interventions designed to bring about learning, and "training" as interventions specifically aimed to achieve mastery of performance in specified roles or tasks. There is however also in the Western tradition of educational philosophy an original concept of "education" which refers to enabling persons to "realize their potential" across a wide range of valued "human development" (e.g., ideas of "well rounded education").

be concerned with a wide range of target groups: not only youth still in school (who typically lack much work experience outside their home), but also people who already are employed and who need training on the job (or for other jobs), and those who are trying to become self-employed. In addition, certain groups are typically identified for special policy attention on equity ground, e.g., the unemployed, the poorest, the disabled, as well as women and girls and underserved ethnic groups. In particular "regional equity" is generally a driving force in politics. In addition equity concerns focused on especially vulnerable groups often have a geographical focus, e.g., localities suffering sharp drop in employment due to restructuring of industry. However, equity driven aspects of TVET policies also need to be directed at labour market demand, for unless TVET leads to improved earnings for the learners, there is no equity gain either. The wide range of target groups for TVET in any society means that national policies cannot be confined to TVET for youth still in school. Policy has stages: diagnosis of problems and needs for intervention at an early stage of policy preparation, formulation of policy, and follow-up in order to do necessary adjustments, once policy is in place. The type of questions suggested below are thought to be appropriate at the early stage in preparing and formulating TVET policy, and when radical overhaul of policy is being considered.

It is recognized that even if radical restructuring of TVET is planned, only some of these questions may relate to alternatives that are considered in any one country. In some countries there has been experimentation with trying out in some regions or localities, models which radically depart from the mainstream system. In such cases, policy formulation for the entire country can obviously benefit from evaluations of such experimentation. But generally, there will be a need to look at international experience. Some of the questions suggested have been addressed in comparative analysis carried out under the aegis of international agencies involved in TVET (e.g., ILO, and international development banks). But for many issues, there is still much basic evaluative research to be done before there is much "experience" to tap into.⁵

⁵ It is beyond the scope of this paper to attempt a review of research that exists on all these issues. A recent attempt with regard to Sub-Saharan Africa covered a number of these questions but found a lamentably weak knowledge basis on such key issues as cost analysis, external effectiveness of TVET, and comparison of performance of private and public providers: Richard K. Johanson and Arvil V. Adams (2004) Skills Development in Sub-Saharan Africa. Washington: World Bank. The study occasioned a number of background papers on specialized topics. These are available on the web at <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALPROTECTION/EXTLMO,contenMDK:20223878~pagePK:148956~piPK:216618~theSitePK:390615,00.html>

Labour market monitoring and forecasting

A key element in TVET development is to develop feedback to TVET from the labour market, in order to adjust TVET so that it responds to market demand for skilled work. This is especially important for publicly provided pre-employment training, probably less crucial for private provisions that need to respond to demand directly in order to attract trainees,⁶ and still less crucial for on the job training which already occurs in close conjunction with employment.

What will be the future requirements?

Especially in market economies where labour is not assigned to public employment, and where firms need to adjust their own demand for labour in order to break-even in changing market circumstances, conventional forecasting of labour market demand is notoriously inaccurate (certainly long term, but even in the medium term). Countries have for some time been abandoning "old style" manpower planning and are instead concentrating on mechanisms which give signals about current trends. However, under conditions of rapid globalization and technological change, "recent trends" will not suffice as signals for designing TVET for the future. Especially in countries which are not at the receiving end of the international diffusion of technology and globalized trade, policy-making for TVET needs to be informed about how technology which currently is "mainstream" in a given economic sector in the country, may be transformed by innovation already being diffused from technological nodes in other countries. Research has a role to play in attempts to forecast implications for TVET--and for general education--from change in technology and in international patterns of trade, which are in "the pipeline". Since such forecasting will be fraught with much uncertainty, it is better thought of as involving scenarios rather than clear predictions.

⁶ For private provision, this can also be problematic. Those who are willing to pay the fees that private providers pay are not always very realistic about the labour market opportunities which training actually will lead to.

Labour market observatories

Some countries have experimented with "Labour market observatories" (there are several African examples). A common feature of the intended function of such observatories is that they are supposed to collate statistics on changes in the labour market, conduct their own special surveys to supplement such statistics with the aim of providing ongoing feedback to TVET at national, regional and local level so that TVET can be adjusted as to quantity and content and produce an "output" that takes account of change in the labour market. What are the lessons learned, internationally, from such attempts? Do they succeed in producing sufficiently updated and sufficiently local information about labour market absorption of trainees from different training backgrounds? Trends in vacancies in different specialities? Can they also be made to provide feedback as to the actual uses of skills learned, from the surveys they carry out? Does the information reach decision makers on curriculum and expansion of training specialities? Is the information of any use to them? Do they actually use the information to adjust the supply of trainees?

Panels of employers

Some countries (e.g., Denmark) have abandoned reliance on statistics and surveys as a main source of guidance about labour market demand, and set up local panels of employers from the concerned industry sectors to give guidance to TVET. What are the lessons learned from experience with the use of local or regional panels?

Indicators of performance

Performance indicators of the kind set out below are important in several regards: taking stock of one's existing TVET provisions which new policy will seek to improve upon, assessment of strengths and weaknesses of institutional models which exist in other countries and which may be of interest in a new policy in one's own country,

and monitoring of the performance of models brought in by new TVET policy.

"External" and "internal" effectiveness

What indicators are there of external effectiveness of TVET? (e.g., does it improve the chance of finding work? Does it lead to "relevant work"? Does it lead to added income for trainees? Apart from collating existing information from within the country in order to assess such questions, research can address international experience with attempts to institutionalize indicators that address such questions. Are there gains from seeking to institutionalize tracer studies (as in Mauritius)? Is the information put to much use?

A similar set of questions can be asked about internal effectiveness. Statistics on pass rates or marks achieved on exams are typically available. But these do not really say much about what is learned—which may be termed the internal effectiveness of TVET. Since the 1960s a network of collaborating countries has emerged (e.g., IEA, PISA) to test children and youth in certain general education skill areas. Though international standards of TVET do exist (e.g., ISCO) (there are even international TVET Olympics!), so far there is no similar network of collaborating countries with regard to TVET. Meanwhile, there are grounds in any country for research to address the question: What is actually learned in TVET? With the increased use of criterion referenced assessment (to "pass" it takes demonstrated mastery of specified tasks), it should be possible to check actual mastery of tasks.

Equity

Equity is especially problematic for TVET. How equitable is recruitment to TVET from underserved groups? **Do new policies achieve an improvement in this regard? (e.g., the poor, underserved minorities, women and girls).** The geographical inequality of economic dynamism presents special problems for TVET in locations which are remote from the nodes of that dynamism. The more TVET policy stresses the need to reach out and involve "local industry" in TVET, the more TVET provisions become

embedded in geographical economic inequality. Private provisions will typically add to that inequality for they will be strongly concentrated in locations with high local demand for skilled labour. So there is a case for government acting to offset the imbalances which are created by earmarking special resources for TVET catering to "underserved" locations and groups. However, such TVET often will lack good and direct local connections with industry. **Do their trainees suffer from problems of finding jobs? Are there examples of initiatives taken to ease such problems? What do such initiatives achieve?**

Cost

Part of policy preparation is cost analysis. Annual costs of established TVET institutions are usually available, but surprisingly often cost analysis of different training specialties within the same institution are lacking, and surprisingly often cost estimates do not seek to produce combined costs of recurrent expenses and annualized capital expenses. **How to improve the accuracy of cost information? How to ensure use of cost information?**

Efficiency

A series of "internal efficiency" questions relates to the flow of students or trainees internal to courses. Applied to TVET, this would especially be for longer courses which are "pre-employment" rather than to short "training events" and training within industry itself. **Questions include: What are course completion rates, and drop out rates in different types courses? Other indicators (regrettably rarely available) are capacity utilization of facilities and of available human resources.** Benefit-cost analysis is sometimes attempted on TVET (usually Internal Rate of Return estimates) in order to estimate what may be termed external efficiency. It is a method which has been both widely espoused and--especially as a means of estimating benefit-cost to society rather than merely to private persons--widely

criticized. Research has a role in both critically assessing its potential and limitations, and in applying such analysis.

"New Models" for TVET systems

In any country open to radical reform of TVET, policy can be usefully informed by comparative research on experience with new models which have been tried out in other countries. Some such new models include national training authorities, national training funds, and national qualifications frameworks. For all these models which in recent years have internationally been in vogue, there is a need to systematize existing findings and generate new ones on such questions as: How do such policies work out in practice? What works well? What are the shortcomings? What corrective action has been tried? Across all these questions are further dimensions of implementation, cost, outcomes and impact.

National training authorities

Some countries have established national training authorities apart from line government ministries. Typically, they have control of resources which different providers (including line ministries) can apply to funding, at the same time as they are supposed to exercise strategic planning and quality assurance purposes of TVET. They also typically have governing boards with strong representation directly from industry. What is the international experience with such structures (in countries like Britain, South Africa, Chile, and Tanzania)? **What are lessons learned from training authorities?**

Training funds

A number of countries have set up training funds with diverse sources of finance. Typically, there are contributions directly from industry (from earmarked payroll levies,

from government, and in poorer countries also from external financing agencies). These funds are typically controlled by national training boards in which there is strong industry representation. Often they are developed in close conjunction with national training authorities. Often industry itself can apply to such financial funds for some of their internal training activity. **What has the international experience been with training funds?**

Qualifications frameworks

A number of countries have developed national Qualifications Frameworks which typically seek to define the concrete skill requirements (standards) for specified occupations, to certify TVET courses as to level of skills taught in relation to such requirements, to define paths of progression in such courses so that all forms of TVET fit into a single unified framework, and to administer ways of certifying skill levels of individual persons when skills are informally acquired. Examples include Australia, Scotland, South Africa and many others. **What are the lessons learned from national qualifications frameworks?**

Decentralization

There has been an international trend to promote decentralisation of decision making in education. It is of course not ideologically "neutral". Different variants connect differently to influential ideas about how power and authority should be distributed in a "good" society. There are also rationales connected with efficiency concern—that decentralisation is a means of making better use of scarce resources, of motivating people, and of enabling institutions to better achieve their objectives.⁷

For TVET, there is the "efficiency" argument that giving more power to each institution and involving local industry more in its governance, are means of making TVET more locally responsive to industry and thus ensure improved match between what is taught and what is demanded in the labour market. There is also the argument that public institutions can diversify their sources of finance and raise more funds

⁷ See e.g., Keith Watson (1996) (ed.) *Power and Responsibility*. Vol. 3. *Educational Dilemmas: Debate and Diversity*. London: Cassells; and Judith Chapman, William Boyd, Rolf Lander and David Reynolds (1996) (eds) *The Reconstruction of Education: Quality, Equality and Control in Education*. London: Cassells.

by being enabled directly to raise local finance (e.g. "selling" short courses to local industry) and to decide how such extra income should be used. Such an emphasis on "more local decisions" and more local involvement of external "stakeholders" in decisions at the local level, typically go with recommendations for change in the way that TVET is financed. One approach is to develop indicators of institutional performance and to tie public finance to such indicators to a greater extent than previously. Another approach is to give more play to market forces, also for public institutions (for example, leaving institutions to recruit trainees in competition with others, without regard to fixed catchment areas).

In countries with TVET tightly regulated by public bureaucracies and which consider moves towards some form of decentralization, the following questions can be usefully addressed by research: **What are some of the institutional models of more decentralized operations, which exist today? What are the lessons learned from these operations?**

Alternative models of financing

There is currently discussion about the need for more diversified sources of finance in order to cope with high unit costs and tight public finance. In public institutions, this typically would mean moving from full (or nearly full) reliance on ministerial budgets, to (a) charging fees (or higher fees) to the trainees, (b) "selling short courses" to industry (c) selling products produced in Production Units at TVET institutions (e.g., "training with production") (d) setting up alternative channels of external funding by earmarked fiscal measures on the sector concerned (e.g., payroll tax). **What is the experience from use of such alternative or supplementary sources of financing?**

Encouraging Private Provisions

In international policy debate on TVET, there are arguments that national governments should take increased "interest" in the role played by private providers of TVET. The extent of private provision varies greatly among countries, but in some countries

private provisions are a major supplier of institutional TVET, especially in business/commerce related skills, and in ICT (Information and Communications Technology). An issue for policy is how government should relate to the private sector, with alternatives typically ranging from (1) "regulate in order to ensure minimum standards", to (2) encourage as supplement to public provisions, to (3) see public provisions as supplement to private provisions and plan public provisions accordingly to fit around private provisions, to (4) set up accreditation, quality assurance and funding provisions which put private provisions in an "level playing field" in competition with those that are publicly owned. Frequently the statistics base on privately provided TVET is weak. Even if the minimalist option of (1), above, is chosen as policy, there is usually a need to design mechanisms for improved information on private provisions. Are there lessons learned from other countries in how best to achieve such improvement? With more "favourable" policy options, especially if government considers using public funds in support of private provisions, the need for information will be further increased. The private-public policy issue is ideologically fraught and therefore typically subject to much controversy. **What are the controversies? Are there lessons from countries which have introduced various schemes of financing private TVET? For example, what is the experience with "vouchers" which a target group of trainees can "cash in" at any accredited TVET provider (private or public)? How do they handle quality assurance and monitoring of private providers? What are equity consequences of support to private provisions? Are private institutions any more efficient than public ones?**

Schemes to make industry do more training

A variety of interventions have been tried to make industry do more training than it does when left to its own devices (legislation "requiring" them to train (Korea), tax credits for training (Chile), funding by competitive application from national training funds (or from industry specific funds). **What are the lessons learned from different interventions? One common experience is that it tends to be the large firms that**

make most use of available incentives, and that more is used on training for staff at high levels, than what schemes intend. Some countries have introduced changes to induce more small firms to make use of such incentives, and some (at least one, Chile) have adjusted funding to stimulate more training of production workers and less focus on management training. **What is the experience with such schemes?**

Modularization of the curriculum

In some countries, there has been a switch in TVET curriculum design away from "long courses" with assessment of learners at the end, to programs consisting of sequences of short courses (modules) with assessment at the end of each module (typically "criterion based") and with more flexibility for trainees to sequences tailored for their particular requirements (and pace of progress). The approach is also advocated as a means to enable trainees to more easily "interrupt" and later "return to" training. What has been the experience of such modular models? Some of the issues are: Is there improved learning? Is "flexibility" made use of? Does it lead to excessive fragmentation? "Assessment overload"?

Human Resource Development

Qualified TVET human resources are in chronic short supply in many countries. At the most basic level, there is the problem of how best to institutionalize initial instructor training and how best to recruit instructor-trainees to such training. Small countries frequently have problems designing provisions for instructor training in the many vocational specialities in such a way that they avoid underutilization of training capacity. Large and small systems have problems ensuring that the pedagogy part of such training will be sufficiently relevant for the practicalities of skills teaching in the concerned vocational specialty. There is also the problem of ensuring recruitment of prospective instructors who have sufficient work experience from relevant industries,

and if such applicants are available, how to screen out those who are the rejects from industry. If industry is booming, there is the problem of retaining good TVET staff who then are tempted by frequently higher pay in the occupations they are preparing others for. Throughout the world there is a shortage of in-service staff development opportunity for TVET instructors, so as to keep abreast of technological change.

How do "other" countries cope with human resource problems for TVET? Are there schemes which seem to improve the training part of these problems? Workable and affordable incentive schemes to prevent loss of the best TVET staff to industry?

Coping with Management Complexity

A number of the changes mentioned earlier (e.g., decentralization of decisions on what to teach and use of resources, competing with other training providers, diversifying sources of finance, involving local industry in boards of management) would add complexity to the management task of TVET at local institutional level. Does management of TVET institutions rise to the task of coping with increased complexity of their management task? How do they cope with "complexity overload"?

Dual systems of basic TVET

There is internationally much admiration for systems of basic TVET which are "dual" in the sense of being partly based in training institutions external to industry (often public institutions, but they could also be private) and partly in industry itself. Some systems are dual only in an "embryonic sense" in that the industry-based part is but a minor part which typically aims at "work experience" in the occupation

concerned without much specification of a schedule of skills to be learned (e.g., an “attachment”). Fully fledged dual systems (e.g., Germany, Switzerland, Austria) typically make the industry the main arena for training, with external institutional education and training as a concurrent supplement—or in some countries (Denmark, Norway) a foundation period before the apprenticeship in industry commences. My understanding is that China is among those countries which have experimented with a dual system for modern sector TVET. It will then have its own internal experience to be assessed in order for policy makers to judge whether the piloted models are to be expanded and how they might need to be modified. Research has a clear role to play in contributing to that assessment. What has worked well and what has worked not so well? Research can also summarize the international experience with attempts to develop and expand dual systems under different socio-economic circumstances.

Low dosage TVET in mainstream secondary schools

In the mainstream of secondary education, some countries have introduced vocational or practical subjects as a minor portion of the total curriculum load carried by students who take these subjects. Sometimes such curricula are justified by the hope that such “low dosage” TVET will ease the transition of youth into those occupations or sectors for which the practical subjects are “relevant”, and contribute to productivity there. Is that a realistic goal for such mildly “vocalized” secondary education? What are the cost implications? ⁸

TVET for illiterate and semi-literate learners

Many countries have sections of the adult populations who are illiterate or whose

⁸ There is a recent book on this long-standing controversy in development planning: Jon Lauglo and Rupert Maclean (eds) (2005) *Vocationalization of Secondary Education Revisited*. Dordrecht: Springer (in collaboration with UNEVOC and the World Bank).

literacy (and numeracy) skills are too rudimentary for any fluent reading or written expression. Programs responding to demand for TVET from such groups will usually be self-targeted upon people living in great poverty. In most countries, they are disproportionately women. Often they are minorities who are generally underserved with education and other social services. Therefore TVET-programs of this kind will usually have to serve strong equity goals. There is a case for combining such TVET with teaching of basic literacy and numeracy skills. Similarly, in adult literacy programs, there is invariably a demand for skills which teach skills which are directly useful for "income generation". Attempts have begun to summarize, with a focus on Sub-Saharan African experience, the international record of cost, implementation and impact of such combined "TVET and Literacy" programs.⁹ **More evaluative work is needed to provide more strongly founded "lessons" that what can be based from current documentation—both within countries, and internationally.**

Keeping abreast of technology

Especially in a country like China, with much export dynamism, there must be a strong concern to ensure that TVET keeps abreast of technology change in industry. One would expect there to be much learning within industry itself, both informal learning and organized interventions around the introduction of new technology. One would also expect that training often is part of the package purchased from the supplier, when new technology is bought by the firm. One would also expect firms to "buy in" such TVET from private trainers or consulting firms. The question is whether government, or sectoral industry associations, can usefully intervene more in order to further these processes. Research can have a role to play assessing the experience in countries which are known for much training within industry (e.g., quality circles and certification of skill levels, in Japanese industry).

For institutionalized training providers outside of firms, the problems of keeping

⁹ A website that gives some pointers and links is <http://www1.worldbank.org/education/adultoutreach/>
A report specifically on combined literacy and VET is at
<http://www1.worldbank.org/education/adultoutreach/Doc/Skills%20and%20Literacy.pdf>

abreast of technology are especially severe. One would think that a good foundation in science and mathematics is helpful for learning new technology. How adequate is the present foundation which youth have when they enter TVET, and does TVET pay enough attention to such knowledge and skills?

The more capital intensive training is, the more expensive it is to "retool" in order to keep abreast. Placements in "cutting edge" industry (not only for trainees but also for their teachers) are a long recommended recipe. But locally available industry is not always "cutting edge". There is a role for research to take stock of experience with new approaches within a large country like China, and also look abroad to what others have achieved. For example, how far can ICT be a useful means of communication about new technology for TVET? What incentives can public TVET are given for keeping up with technology?

Following up policy

The range of questions for research will naturally be much narrower when the focus is on the follow-up of new TVET policy. Looking to "alternative models" in order to widen the range of options for decision makers will be much less important. But evaluations of different organizational models can still be on the agenda when the decision has been to pursue more than one strategy concurrently, or simply to pilot a new form of TVET alongside continued existence of previously dominant forms. Wise policies allow for a period when it is expected that new models will need to be adjusted (institutionally complex new forms of TVET are very rarely abandoned). Evaluations (in this paper a part of "research") are important for giving feedback that helps inform such decisions to "adjust" implementation. There will also be a clear need to monitor resource requirements, since in any complex reforms of TVET structures these are among the "loosest" parts of the information base (usually the cost is underestimated but since implementation tends to be slower than expected,

the "higher" total costs may well be spread over a longer period than initially assumed, if the intended full scale of implementation in the end is achieved). A badly neglected question for evaluative research on TVET policies involving complex reforms is **impact**. For example, does a "new style" TVET in fact improve the extent to which the skills acquired, are put productively to use in "relevant" work? How are equity concerns accommodated? One does not need to be a cynic to note that there is often much risk in putting that question to empirical tests. Governments in any event seem uninterested in commissioning research on that question.

A stronger research base is needed

Research on TVET is quite limited in most countries. Few countries have specialist professional networks and few have journals, ICT-based meeting places, or other means of supporting the development of professional "nodes" on TVET. Such research as exists is typically concerned with pedagogy and curricula, because it tends to be an outgrowth of TVET teacher education. To the extent that there is research and review work done of the kind policy issues touched upon here, it tends to be commissioned or carried out by international agencies (ILO, UNESCO-UNEVOC, international development banks, a few bilateral development agencies). What is characteristic of that work is that it is performed under great time pressure. If national case studies feed into it, they have to rely on existing documentation which is typically meagre. Thus, it is review work rather than research on primary data. Primary data collection is confined to visits to a few institutions and interviews carried out with persons in positions of responsibility. A major present deficiency is the sparseness of research carried out with sufficient resources and time in order to collect good primary data.

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