Training and Workplace Requirements: Strategies for Minimizing the Mismatch Gap

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ABSTRACT

The need for quality training offered by Technical and Vocational Education and Training (TVET) institutions and the production of graduates who meet the needs of the workplace has been growing in Kenya, Africa and internationally. Changing technology, competition and globalization have been cited as forces putting pressure on industry to rapidly evolve to ensure survivability. This study sought to investigate factors in institutions mitigating against closing the skills gap between what TVET institutions impart and what the modern workplace requires. Data was collected through survey method from trainers in TVET institutions in 17 Counties across Kenya. Selective interviews were also conducted in these institutions. The study found that indeed a mismatch or skills gap between what TVET offered and workplace requirements exists. The skills gap was attributed to several factors including, curriculum that was not regularly updated and with the participation of all relevant stakeholders; lack of adequate and competent and up to date instructors; insufficient teaching and learning facilities; inappropriate teaching and learning facilities, poor collaboration with training providers and the workplace; poorly supervised industrial attachment and an inappropriate attitude towards lifelong learning. A strong linkage between training institutions and the workplace was indicated as critical in reducing the skills gap. TVET instructors and Principals reported minimal contact with the workplace, with industrial attachment being the only point of convergence between the two. The study recommends that the TVET institutions should work diligently towards improving linkages in order to narrow the mismatch in skills gap.

Key Words: Mismatch Gap, Technical and Vocational Education and Training (TVET)

INTRODUCTION

The TVET Strategy Paper Vision 2030 (Republic of Kenya, 2007), and the Ministry of Education, Science and Technology recognized and pointed out that there exists a mismatch between the skills imparted to graduates from TVET Education and Training institutions and the industry. This is a problem that is not unique to Kenya as most countries, even those technologically more advanced continually grapple with this issue. For vision 2030 to be archived, a skilled human capital is inevitable. This is why this paper seeks to address training and work place requirement gaps and recommend strategies of minimizing the mismatch gap.

The Kenya Vision 2030 recognizes science, technology and innovation as the foundation upon which the economic, social and political development of the country will be anchored over the next two decades in order to accelerate Kenya's transformation into a middle income country by the year 2030 (Republic of Kenya, 2007). In this regard, education in general and Technical and Vocational Education and Training (TVET), in particular, are expected to provide the knowledge base and requisite human resource capacity to enhance national productivity. This cannot happen if there is a mismatch between what TVET institution train and what the labour market demands.

The TVET system faces challenges and constraints which inhibit the process of human capital development. The current TVET curriculum is not flexible and responsive enough to meet the changing needs of the labor market (Nyerere, 2009). Therefore, there is a mismatch between the skills learned and skills demanded from industry. In addition to this, the training system lacks records of existing skills needs in the labor market and means to determine the current and future demands for skills. Furthermore, the assessment and certification does not provide an accurate measure of corresponding competencies gained and the training system lacks benchmarks for realignment with global trends in training standards (Wanyeki, 2015).

In order to address the above challenges a study, "skills inventory, training needs and curriculum structure" was carried out on the TVET system in 2005. The study sought to establish a skills inventory, training needs, technology and innovation in industry. The study came up with important findings but fell short of establishing a data base of

skills which could be updated periodically. In addition, the country has since formulated Vision 2030, a long-term development blue print, which highlights key sectors that would enhance economic growth (republic of Kenya, 2007). It was therefore necessary for a follow up study to be commissioned. This paper seeks to address training and work place requirement gaps and recommend strategies of minimizing the mismatch gap.

LITERATURE REVIEW

Changing technology

Training today involves a multi-faceted work environment and requires lifelong professional development. Skills imparted by training institutions should reflect the times in which they live in if instruction is to be effective (Asunda & Hill, 2008). For training to remain relevant, it calls for continuous retraining of trainers, funding necessary curriculum materials and updating of the curriculum. This difficult balancing act of what to train to remain relevant to the job market has currently placed TVET at a critical juncture in its history in Kenya. This is because if you train for today you become obsolete very fast if you train for tomorrow you lack application for today. This problem is complicated by the rapid changing technology. Therefore, the correct strategies for minimizing the mismatch gap caused by this phenomenon must be addressed if TVET is to be relevant to the job market.

Globalization and Competition

Preparing TVET graduates who will be responsive to a rapidly changing workplace and the global economy as a whole has become a major challenge for TVET institutions (Asunda & Hill, 2008). The economic restructuring brought about by globalization means the nature of skills required for the knowledge economy is a moving target, and can only be predicted at a highly aggregated level for a few years ahead (Khambayat & Majumdar, 2010). This makes aligning training to the labour market requirements very expensive and a difficult task too. Also lagging behind, for a few months, may mean that you are completely disconnected to the entire world (Khambayat & Majumdar, 2010). This might lead to your best TVET experts leaving the country to go and work in developed countries. This brain drain has contributed to the third world not developing technologically (Khambayat & Majumdar, 2010).

Curriculum

Zais (1976) asserted that curriculum is used by specialists to refer to planning for education for the youth. Education is widely seen as one of the most promising paths for youths to realize better, more productive lives and as one of the primary drivers of national economic development (Glennerster, Kremer, Mbiti & Takavarasha, 2011). The curriculum is the blue print on which training is anchored. If the curriculum is irrelevant the training also becomes irrelevant.

Participation by all relevant stakeholders

Training in the TVET sector must essentially target the labour market. For this training to be relevant all TVET stake holders need to be involved in its development. For stake holders to be effectively involved clear laid down policies should be put in place indicating which type of stakeholder will be involved and at which stage of the process.

Instructors

When students leave TVET institutions ill-prepared for the workplace, educators have commonly been indicted as having failed those students (Sang, Muthaa & Mbugua, 2012). This is an indicator that teachers play a critical role in determining the quality of TVET graduates. Therefore it is imperative to make available quality teachers so that the quality of TVET instruction delivery could be improved.

Teaching and learning facilities

The quality of curriculum materials directly impacts the quality of training provided. Curriculum materials are the vehicles of instruction. They help in curriculum delivery and also reinforce instruction delivery. For any TVET program to offer meaningful training it must have quality teaching and learning materials. That is why it makes it important for this study to examine the quality of teaching and learning facilities and there contribution towards quality training.

METHODOLOGY

This study sought to investigate factors in TVET institutions militating against closing the skills gap between what institutions impart and what the modern workplace requires. Data was collected through survey method from trainers in TVET institutions in 17 Counties across Kenya. Selective interviews were also conducted in these institutions**.** The population for the study included private sector organizations, public sector organizations (Government Ministries and Parastatals), TVET institutions, and TVET Teacher Training Institutions. The categories of the population targeted and size are shown in Table 1.

Table 1: Distribution of sampled institutions

Respondent Category	Population	Sample Size
Government Ministries	41	20
Parastatal	-	20
Public Universities	7	7
Private universities	18	18
Chartered Private Universities	18	10
TVET Institutions	19	19
Institutes of Technologies	14	14
Registered Private Colleges	279	150
TVET Current Trainees	-	1000
TVET Past Trainees	-	1000
Private sector industries	200	113

Cluster and stratified sampling techniques were used to divide the study into research administrative regions comprising of Nairobi, Coast, Central, Eastern, North Eastern, Western, Nyanza, and Rift Valley. Further, purposive, convenience and random sampling techniques were used in the identification of respondents where applicable.

Pedagogical Training of TVET Trainers

This item sought to determine the ability of TVET trainers to effectively operate in an instructional environment. The items cover broad pedagogical considerations that included preparation, presentation and evaluation of training.

Table 2: Pedagogical Training of TVET Trainers

Pedagogical Skills	N	Highly unable	Not sure	Partially able	Highly Able	N/A
Identifying learning needs	368	0.5	0.8	30.4	67.7	0.5
Developing learning plans	364	1.4	2.2	34.6	61.3	0.5
Teaching methodologies	366	0.8	5.5	29.5	63.9	0.3
Using Educational psychology	364	2.2	13.7	42.9	40.1	1.1
Managing a flexible training environment	361	1.7	5.8	38.5	53.7	0.3
Developing work instructions	357	0.8	3.9	34.5	60.5	0.3
Developing learning materials	365	1.4	3.6	35.3	59.5	0.3
Preparing audio-visual aids	363	16.5	14.3	40.2	25.6	3.3
Undertaking competency assessments	362	1.4	3.9	35.6	58.3	0.8
Developing program design and evaluations	360	3.9	12.5	44.2	38.6	0.8
Supervising work experience	358	5.6	15.1	44.1	33.5	1.7
Working in Teams	358	1.1	3.4	22.9	72.3	0.3
Presenting Lessons	351	2	4	27.4	65.8	0.9

Table 2 provides responses relating to Teaching and Training Skills as listed. The responses indicate that most of the trainers were partially to highly able to execute their responsibilities on various pedagogical considerations.

Level of TVET Trainers Relevant Occupational Skills

This item sought to determine the level of TVET Trainers occupational skills in the area in which they were providing training.

Table 3: Level of TVET Trainers Occupational Skills

Occupational Skills	N	Unskilled	Lowly skilled	Not sure	Skilled	Highly skilled	N/A
Selecting and using materials and tools	367	0.3	1.6	2.2	36	58.9	1.1
Reducing waste in production	360	1.7	3.1	9.4	43.3	40.3	2.2
Quality control instructions	358	0.8	2.5	9.2	48	37.7	1.7
Increasing productivity	339		2.9	4.7	40.1	50.7	1.5
Understanding and implementing drawings, sketches, and other written instructions.	352	0.9	4	9.7	39.5	44	2

The responses received showed (Table 3) that the majority of trainers were either partially or highly skilled in their occupational areas.

Employability and Empowerment Skills Possessed by TVET Trainers

This item sought to determine the level of employability and empowerment skills possessed by TVET trainers.

Table 4: Employability and Empowerment Skills Possessed by TVET Trainers

	N	Unskilled	Lowly skilled	Not sure	Skilled	Highly skilled
Language skills (oral and written)	374	0	0.3	0.8	22.7	75.9
Computer literacy skills	369	0.3	4.6	3.5	39	52.3
Communication skills	371	0	0.5	3.2	25.9	70.1
Influencing and persuading others	369	0.3	1.1	5.1	37.4	56.1
Life skills	370	0.5	1.4	7.3	45.4	45.4
Work improvement skills	350	0.3	1.7	6.3	46.9	44.9
Teamwork	375	0	0.8	2.1	31.7	65.3
Flexibility	373	0	1.1	3.2	39.1	56.6
Adaptability	374	0	1.1	4	36.1	58.8
Innovation	369	0.3	2.7	8.4	42.8	45.8
Critical thinking	371	0	1.9	5.7	42	50.4
Problem-solving	370	0	1.4	3.5	42.7	52.4
Decision-making	374	0	1.1	5.6	39.8	53.5
Managing change	370	0.5	4.3	7.8	46.2	41.1
Managing stress	372	0.5	4.6	8.9	50.3	35.8
Self-management	347	0	1.4	3.5	36.6	58.5

Table 4 provides information relating to employability empowerment skills as possessed by TVET Trainers. The findings showed that the majority were either skilled or highly skilled in the listed areas or fields.

Management Skills of TVET Trainers

This item sought to determine the management skills possessed by TVET trainers.

Table 5: Management Skills of TVET Trainers

Management skills	N	Unskilled	Lowly skilled	Not sure	Skilled	Highly skilled
Leadership	365	0.3	2.2	6.3	46.3	44.4
Supervision	356	0	3.7	7.3	47.2	41.3
Planning	366	0.3	2.7	4.1	48.1	44.5
Report writing	362	0.8	3.9	6.4	47.5	40.9
Quality management	365	1.4	6	10.7	48.5	33.2
Financial management	364	1.6	10.2	18.1	40.1	29.7
Public relations	366	0.8	4.6	7.1	46.7	40.4
Managing meetings	367	1.4	4.4	11.2	45.8	36.8
Managing crises	360	1.7	7.2	13.1	49.7	27.5
Managing training staff	362	3	6.9	15.5	41.7	31.5
Strategic management	364	2.2	7.1	15.4	43.4	30.8
Time management	343	0.3	3.5	3.8	37.6	54.8

Table 5 provides information on the level of management skills possessed by TVET trainers. The data showed that the majority of trainers are either skilled or highly skilled in the areas listed.

Teaching and Learning Materials in TVET Institutions

The respondents in TVET institutions reported that both equipment and materials needed for practical training was often inadequate even though lately there have been attempts to improve the situation. This is a critical aspect of ensuring the quality and relevance of training. Providing quality TVET is expensive. This is clearly shown in table 6, 7, 8, 9, 10, & 11.

Availability, Sufficiency and Serviceability of Relevant Tools, Machines and Equipment in TVET Institutions

Respondents were asked to indicate the level of availability of essential tools, machines and equipment necessary to conduct effective training.

Table 6: Availability of Relevant Tools, Machines and Equipment in TVET Institutions

Availability	N	Not available	Least available	Partially available	Available	Highly available
Tools, e.g. hand tools, calibration tools, precision, gauges etc	156	9.6	10.9	46.2	26.9	6.4
Machines, e.g. Lathes, compacting, washing machines, driers, computers, printers, copiers, mixers.	175	9.1	16.6	32.6	34.3	7.4
Equipment, e.g. oscilloscopes, engine testing, theodolite, lab equipment, etc	148	24.3	23.6	30.4	18.9	2.7

Table 6 provides information from TVET trainers regarding the availability of Tools, Machines, and Equipment in their Institutions for training students to acquire the needed skills for industry and market. The respondents indicated that generally the tools, machines and equipment were inadequate. Additionally, even where available they were insufficient for effective training purposes as shown in Table 7.

Table 7: Sufficiency of Tools, Machines and Equipment in TVET Institutions

Sufficiency	N	Not sufficient	Least sufficient	Partially sufficient	Sufficient	Highly sufficient
Tools, e.g. hand tools, calibration tools, precision, gauges etc	148	17.6	18.2	39.9	20.9	3.4
Machines, e.g. Lathes, compacting, washing machines, driers, computers, printers, copiers, mixers.	166	17.5	20.5	38.6	18.7	4.8
Equipment, e.g. oscilloscopes, engine testing, theodolites, lab equipment, etc	139	31.7	27.3	29.5	9.4	2.2

Furthermore as depicted in Table 8 the serviceability of the tools, machines and equipment was not appropriate. Most respondents indicated that these were not serviceable to partially serviceable.

Table 8: Serviceability of Tools, Machines and Equipment in TVET Institutions

Serviceability	N	Not serviceable	Least serviceable	Partially serviceable	Serviceable	Highly serviceable
Tools, e.g. hand tools, calibration tools, precision, gauges etc	146	12.3	15.8	29.5	32.9	9.6
Machines, e.g. Lathes, compacting, washing machines, driers, computers, printers, copiers, mixers.	163	11.7	14.7	22.7	39.9	11
Equipment, e.g. oscilloscopes, engine testing, theodolites, lab equipment, etc	139	25.9	23.7	25.2	18	7.2

Availability of Training Consumables, Training Infrastructure, and Human resources

Respondents were asked to indicate the availability and sufficiency of training consumables and infrastructure and availability of adequate human resources to ensure effective training programs are conducted. Table 9 shows the respondents' views regarding the availability and sufficiency of consumables for training in TVET institutions.

Table 9: Availability and Sufficiency of Consumables for Training in TVET Institutions

	N	Not sufficient	Least sufficient	Partially sufficient	Sufficient	Highly sufficient
Consumables, e.g. timber, cement, flour, gas, oil, steel	160	8.1	10	33.1	40	8.8
Reusable e.g. electric cables, towels, bricks, aggregates	153	8.5	13.1	39.9	34	4.6
Any other materials,	85	15.3	21.2	36.5	21.2	5.9

Respondents indicated that some of the consumables were either not available or insufficient to sustain effective training.

The next question was on the availability and sufficiency of training infrastructure. The question recognizes the need for adequate, suitable and accessible infrastructure in an institution as a prerequisite for efficient and effective performance and service delivery. Infrastructure availability and sufficiency is an incentive for attracting students, improving learning and environment for learning delivery. It also attracts and retains qualified and competent teaching and support staff in the institution as well as the institution's image to clients and the public. Table 10 shows that most TVET Institution's do not have adequate, suitable, appropriate and accessible infrastructure and facilities to conduct effective training.

Table 10: Availability and Sufficiency of Training Infrastructure in TVET Institutions

	N	Not adequate	Least adequate	Partially adequate	Adequate	Highly adequate
Learning Spaces, e.g. Classrooms, lecture halls,	194	11.9	13.4	35.1	35.1	4.6
Practical learning spaces, e.g. workshops, labs, kitchens, drng rooms,	184	13	17.4	36.4	29.9	3.3
Furniture e.g. chairs, stools, tables, drawing boards, cutting boards,	198	9.1	24.7	35.9	25.3	5.1
Recreational areas, e.g. fields, indoor games, pools	185	22.7	26.5	28.6	16.8	5.4
Transportation, e.g. motor vehicles	186	13.4	16.1	32.8	31.7	5.9
Accommodation, e.g. hostels	185	20.5	29.7	34.1	11.9	3.8
Footpaths and roads within the institution	188	11.2	13.8	30.3	33	11.7
Utilities, e.g. Water, electricity, sanitation	190	6.8	10	30	40	13.2

	N	Not adequate	Least adequate	Partially adequate	Adequate	Highly adequate
Communication, e.g. ICT, Internet	194	14.9	20.6	36.6	21.6	6.2
Office Equipment, e.g. copiers, computers, printers, faxes	193	15	22.8	41.5	15	5.7
Maintenance e.g. lawn mowers	131	22.9	15.3	27.5	28.2	6.1

On the question of availability of adequate human resources, the respondents' feedback is reported in Table 11. The question recognizes the critical role of Human Resource in an Institution. The findings showed that majority of the TVET Institutions do not have adequate human resources.

Table 11: Availability and Sufficiency of Human Resources in TVET Institutions

Category of Employees	N	Not adequate	Least adequate	Partially adequate	Adequate	Highly adequate
Teaching Staff (Instructors)	192	7.8	9.4	49.5	26	7.3
Lab and workshop staff (technicians)	176	22.2	19.9	42	13.6	2.3
Office (Secretaries, clerical, messengers Accounting)	191	25.7	20.9	27.2	21.5	4.7
Support Staff e.g. Cleaners, cooks, farm workers, drivers, gardeners,	185	14.6	20.5	27.6	31.4	5.9
Security Staff	177	10.2	17.5	32.8	33.9	5.6
Staff Development for teaching staff	167	34.1	24	28.7	12	1.2
Staff Development for non-teaching staff	153	43.1	20.3	22.9	13.7	0

Linkages or Partnerships between Employers, Training Providers and other Institutions

This item sought to establish the types of linkages that existed between employers, training providers and other institutions such as professional bodies. The response by employers is given in Table 12

Table 12: Linkages or Partnerships Between Employers and Training Providers.

	Frequency	Percentage
Link with universities / MOU with universities and colleges	23	18.5%
Collaboration with both local and international universities	6	4.8%
Involvement in curriculum development	2	1.6%
Accreditation to certification bodies	11	8.9%
Employees are members of chartered institutions e.g. ICPAK	13	10.5%
Extensive partnership in technology and entrepreneurship	3	2.4%
Industry offers industrial attachment to students	67	54%
Total	124	100

As shown in Table 12 the greatest linkage reported is between employers and training institutions through the provision of industrial attachment for trainees only. Other linkages were relatively weaker.

Linkages between TVET Institutions and other Relevant Organizations

Respondents' views were sought regarding relevant collaborations and partnerships with external institutions. The question recognizes the importance of collaboration, partnerships, networking and linkages in performing TVET activities including training delivery. The data in Table 13 shows that for the most part linkages and collaborations with external institutions were not adequate.

Table 13: Linkages between TVET Institutions and other Relevant Organizations

Partnerships	N	Not adequate	Least adequate	Partially adequate	Adequate	Highly adequate
Curriculum development	184	0.5	4.9	15.2	58.2	21.2
Examinations (external)	186	2.7	2.7	10.8	61.3	22.6
Internal Evaluation	184	0	2.2	10.9	62	25
Internship (attachment, field work etc.)	184	4.3	4.9	29.9	45.1	15.8
Collaboration with relevant formal industry	186	15.6	16.1	43	18.3	7
Collaboration with relevant Non - formal sector	183	19.7	29	32.8	14.8	3.8
Quality Assurance	182	7.1	16.5	34.1	32.4	9.9
External inspection and review	178	25.3	36	24.7	12.9	1.1
Income generating activities	16	37.5	25	25	6.2	6.2

Recommendations based on the findings of this study:

a) To address the mismatch or skills gap, there is need to involve the active partnership and participation of industry or the workplace to ensure the relevance of the curriculum to meet job market demands;
b) Regular collaboration between industries and training institutions is necessary to ensure emerging technologies, products and services that require new skills are addressed through changes in training methodology and curriculum;
c) It is recommended that future reviews of the TVET curriculum and skills inventory should include employability skills, and empowerment skills in addition to the technical skills;
d) Industries should collaborate with TVET institutions by supporting practical experience through appropriate industrial or work attachment;
e) To ensure the seriousness of practical training by students, industrial attachment or work experience should form part of assessment and certification.
f) There is need to ensure well qualified TVET teachers are recruited and posted to institutions;
g) Lifelong learning should be incorporated in the development of TVET teachers to ensure that they are able to remain in touch with changing technology and work environment;
h) There is need to ensure there is regular and effective quality assurance inspection of both private and public TVET Institutions to ensure that the curricula, teaching environment, and teachers' qualifications are up to standard;
i) The Skills Inventory should be expanded and updated regularly to ensure it remains relevant to the needs of the workplace or job market;
j) There is need for TVET Institutions to continually review their curricula to meet the needs of a diverse workplace. For example those located close to rural communities should take into consideration the

specific needs of those locales in planning their programs so that they can offer training that matches those needs;

k) In developing curriculum for TVET, following Training Needs Assessment, generic skills, employability skills and interpersonal skills need to be included for training students and staff to enhance their job performance and service delivery;
l) There is need for TVET institutions to be equipped with suitable and appropriate training facilities that will enable delivery of relevant skills that match those needed by the workplace;
m) It is recommended that machinery, equipment and tools in TVET Institutions be serviced regularly and be well maintained to prolong their lives and ensure their efficiency and effectiveness in training delivery.
n) It is recommended that more needs to be done in terms of awareness creation and sensitization to enable more women to pursue and acquire skills that are presently dominated by men;
o) Lifelong learning opportunities should be enhanced to cater to the needs of modern workers who require regular updating for efficient and effective work performance as the work environment continue changing;
p) There is need for all TVET trainers to be given the training opportunities to acquire, update or improve their technical skills as technological, legal and other environmental and professional changes take place continuously;

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