



NATIONAL CONSTRUCTION  
AUTHORITY

**REPORT ON MAPPING OF TECHNICAL  
TRAINING INSTITUTIONS IN KENYA**

*Presented by the*

**DEPARTMENT OF RESEARCH,  
TRAINING & CAPACITY BUILDING**

**January, 2016**

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## ABBREVIATIONS

NCA	-	National Construction Authority
MoEST	-	Ministry of Education, Science and Technology
KIHBT	-	Kenya Institute of Highways and Building Technology
MOYAS	-	Ministry of Youth Affairs and Sports
TVETA	-	Technical, Vocational, Educational and Training Authority
RIAT	-	Ramogi Institute of Advanced Technology
CUE	-	Commission for University Education
NITA	-	National Industrial and Training Authority
MLSSS	-	Ministry of Labour, Social Security and Services

## EXECUTIVE SUMMARY

Technical education is necessary if Kenya is to achieve vision 2030. Relevant skills have to be given in Technical training institutions. Kenya's vision 2030 blueprint envisages a country that has achieved middle income status supported by five key sectors of the economy including the Construction Industry.

In manufacturing the blueprint envisages a newly industrialized country, powered by a high-skilled workforce. To get a skilled manpower there has to be world class training and that is where the problem lies. To be industrialized Kenya needs people with technical skills. This mapping exercise focused on the capacity of training institutions, relevance of the facilities, and relevance of curriculum/course to the construction industry and the qualifications of the trainers.

The specific objectives of the mapping were to establish the number of training institutions, their geographical distribution, ownership status and their capacity. The findings would be used to develop training and capacity building interventions and policies. Secondary database from Ministry of Education and National Industrial Training Authority was used to first identify names of institutions to be mapped out. Self-administered questionnaires were adopted as source of data. In addition face to face Interviews were made during due diligence visits to validate the information filled in the questionnaire. 438 technical institutions were identified prior to the mapping exercise and 353 of them responded positively to the exercise hence the response rate was 81%. The training institutions that responded to the exercise spread over 34 counties representing 72% of national coverage.

Findings revealed that Kakamega County had the highest number of institutions (33) representing 9.3%. Homa Bay, Kirinyaga, Murang'a, Nyandarua, Isiolo, Nyamira and West Pokot Counties had 1 institution each representing 0.3% of the total number of institutions. 95.8% of the institutions were fully registered with relevant bodies while 4.2% had no registration details. Majority of the institutions were registered by Ministry of Youth Affairs and Sports (36%), most of which were from Western and Lower Eastern region. In terms of ownership, 24% of the institutions were privately owned while 76% were public entities.

Majority of the institutions were funded through tuition fees paid by the students (38.4%) while a smaller proportion were subsidized by their respective county governments (6%). County governments which subsidized their technical training institutions were; Nairobi (1 institution), Kakamega (21 institutions), Machakos (5 institutions), Nakuru (4 institutions) and Vihiga (7 institutions).

Further findings revealed that Masonry, Carpentry/Joinery and Electrical installation were the prevalent courses at Certificate, Artisan and Trade test levels. It is also important to note that Electrical installation was offered by technical institutes at all levels. Considering the level of enrollment, most students taking construction worker level courses (Artisan, Certificate, Craft, Trade test) were enrolled in Electrical installation course (5433) which represents 22.9% of the total enrollment. Similarly, for construction site supervisor level courses (Diploma, Higher Diploma, and Degree) most students were enrolled to electrical installation (1005) which represents 22% of the total enrollment in construction site supervisor level courses. 33 institutions (9.3%) had some of their courses discontinued due to various reasons such as; lack of training instructors, shortage of machines in the workshops and low student turn out. 89.5% of the institutions had workshops and of these, 59.8% had their workshops equipped with enough machines. The total number of trainees in the institutions which responded as at time when the exercise was conducted was 30,397 and the total number of graduates in the last 5 years in all the institutions was 76,494. Therefore the course completion rate among the trainees was 0.5050. This implies that assuming all the trainees were to be enrolled at the same time, then only 50.5% of them would to complete their respective courses.

Cumulatively, all the institutions had 2047 training instructors. Majority of the instructors (29.4%) had Diplomas as their primary qualification and only 43% of them had additional qualifications in training. Also, 36% of the trainers had between 6 and 10 years of experience in the teaching industry while only 9% had over 20 years of experience in teaching. Out of the 353 training institutions, 326(92%) had industrial attachment requirements in their respective courses. It is therefore important to ensure that they embrace the need for industrial attachment provision in order to assess the level of skills acquired by the learners before they join the construction industry.

The fundamental justification for the mapping exercise was to identify the sector skill gaps to expand vocational education in order to increase the training opportunities for the increasing school leavers and enrich the school curriculum with technical subjects. It was concluded that the existing technical institutions in Kenya suffer from critical problems including the decline of quality (occasioned by low trainer competencies and lack of training equipment), lack of relevance to occupational and social realities, under-enrolment and under-funding. This shows that in order for Kenya to have a bright future in the construction industry, the importance of skills and adequate training in the technical training institutions need to be over-emphasized in order to cope with the evolving technological world. Based on the findings, there is need to ensure that the training institutions curriculum reflects the skills needed in the construction sector labour market.

## 1.0. INTRODUCTION

There is need to expand vocational education in order to increase the training opportunities for the increasing school leavers and lastly the need to enrich the school curriculum with technical subjects. The National Construction Authority, under the National Construction Authority Act 2011 section 5 is mandated to initiate and maintain a construction industry information system as well as provide, promote, review and coordinate training programs organized by public and private accredited training centers for skilled construction workers and construction supervisors. Consequently, the Authority set out to map training institutions that offer construction related courses to form part of the Authority's construction information system as well as identifying the potential institutions with which the Authority would carry out its training and capacity building program.

Following the preliminary mapping of technical training institutions towards the end of 2014, a detailed research was conducted to collect information to aid the Authority to formulate an elaborate action plan to implement in collaboration with the technical institutions. The Authority embarked on a fact finding mission covering the institutions which fall within the jurisdiction of the Regional Offices.

This document presents the findings of a mapping exercise conducted in September 2015 aimed at mapping the training institutions in various regions offering construction related training and skills as well as assessing their current status and adequacy. The status survey focused on number of institutions, their mode of ownership (public or private), registrations status, technical courses offered and infrastructural capacity. The mapping exercise carried out by the National Construction Authority (NCA) was set out to gather information on the registered training institutions to form part of the Authority's construction information system as well as identifying the potential institutions with which the authority would carry out its training and capacity building mandate.

### 1.1 Justification for the Mapping Exercise

Technical education is necessary if Kenya is to industrialize by the year 2030. Relevant skills have to be given in Technical training institutions. This mapping exercise focused on the adequacy of training facilities, relevance of facilities, and relevance of curriculum/course relevance to the construction industry and the trainers' level of qualifications. To steer the exercise, The National Construction Authority Board of Directors gave the directive to come up with instruments of the mapping exercise which was subjected to various consultative processes including a piloting exercise.

## 1.2 Objectives

The following were some of the objectives of conducting the mapping exercise;

- a) To identify the number of training institutions, their geographical spread, mode of ownership and their current capacity against which training and capacity building interventions and policies can be based.
- b) To identify sector skill gaps with respect to trainer competences required and how many are needed.
- c) To provide prioritized recommendations and an action plan that the Authority and other key stakeholders should undertake to address any identified gaps.
- d) To provide timely and reliable data to assist the Authority to institute and plan future training needs.
- e) To formulate a means of accreditation.

## 1.3 Situation Analysis

Kenya's vision 2030 blueprint envisages a country that has achieved middle income status supported by five key sectors of the economy including the Construction Industry. In manufacturing the blueprint envisages a newly industrialized country, powered by a high-skilled workforce. To get a skilled manpower there has to be world class training and that is where the problem lies.

## 2.0. KEY FINDINGS

### 2.1 Spatial distribution of training institutions

There were a total of 353 training institutions which responded positively to the Mapping exercise and were distributed among 34 Counties shown in the table below;

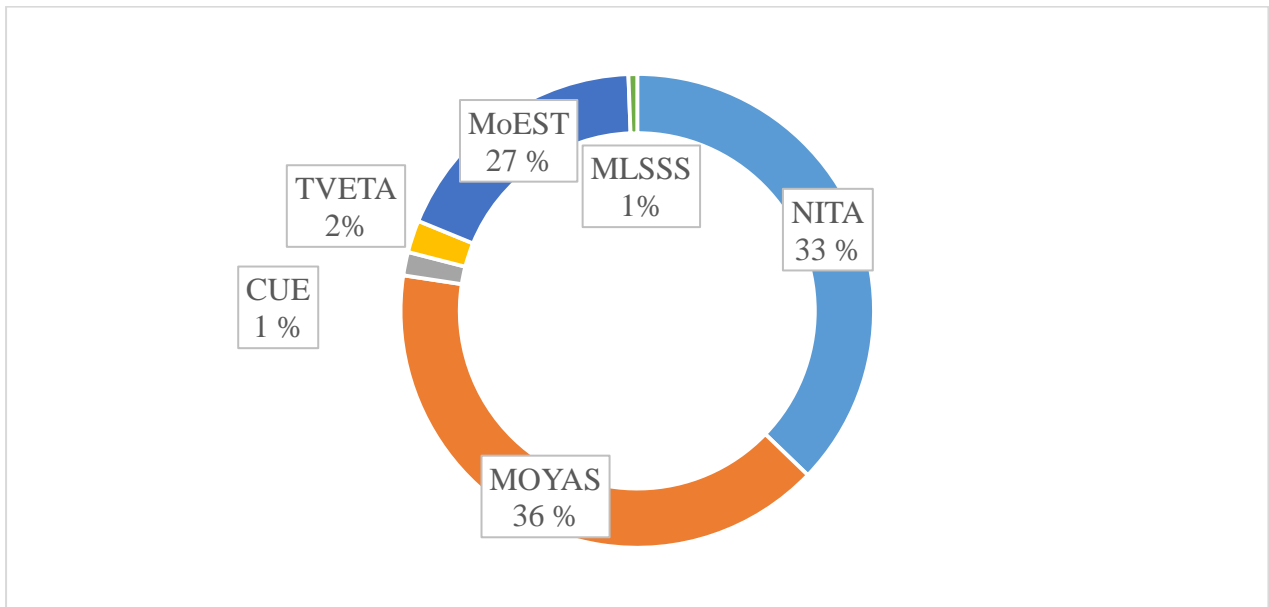
Region	Counties	No. of Training Institutions	Percentage Representation
Nairobi	Nairobi	19	5.38 %
Nyanza	Kisumu	12	3.40 %
	Siaya	3	0.85 %
	Homa Bay	1	0.28 %
	Kisii	17	4.82 %
	Nyamira	1	0.28 %
	Migori	4	1.13 %
	Western	Kakamega	33
North Rift	Busia	17	4.82 %
	Bungoma	26	7.37 %
	Vihiga	18	5.10 %
	Uasin Gishu	7	1.98 %
	Nandi	5	1.42 %
Coast	Trans Nzoia	3	0.85 %
	Elgeyo/Marakwet	2	0.57 %
	West Pokot	1	0.28 %
	Mombasa	6	1.70 %
	Kilifi	2	0.57 %
Mount Kenya	Taita Taveta	4	1.13 %
	Embu	5	1.42 %
	Nyeri	6	1.70 %
	Kirinyaga	1	0.28 %
	Murang'a	1	0.28 %
Lower Eastern	Nyandarua	1	0.28 %
	Kitui	30	8.50 %
	Machakos	26	7.37 %
Central Rift	Makueni	18	5.10 %
	Bomet	20	5.67 %
	Kericho	11	3.12 %
	Nakuru	20	5.67 %
Upper Eastern	Narok	9	2.55 %
	Meru	17	4.82 %
	Isiolo	1	0.28 %
	Tharaka-Nithi	6	1.70 %
<b>Total</b>	<b>34</b>	<b>353</b>	<b>100%</b>



In general, all the institutions which responded positively to the mapping exercise covered **72.34 %** of all the Counties in Kenya. Kakamega County had the highest number of institutions (33) which represents 9.35% of the total number of institutions while Homa Bay, Kirinyaga, Murang’a, Nyandarua, Isiolo ,Migori, Nyamira and West Pokot Counties had 1 institution each representing 0.3% of the total number of institutions. Counties which had no information about the technical institutions included; Garissa, Wajir, Tana River, Lamu, Kiambu, Kajiado, Turkana, Marsabit, Samburu, Laikipia, Baringo, Kwale and Mandera.

## 2.2 Registration status

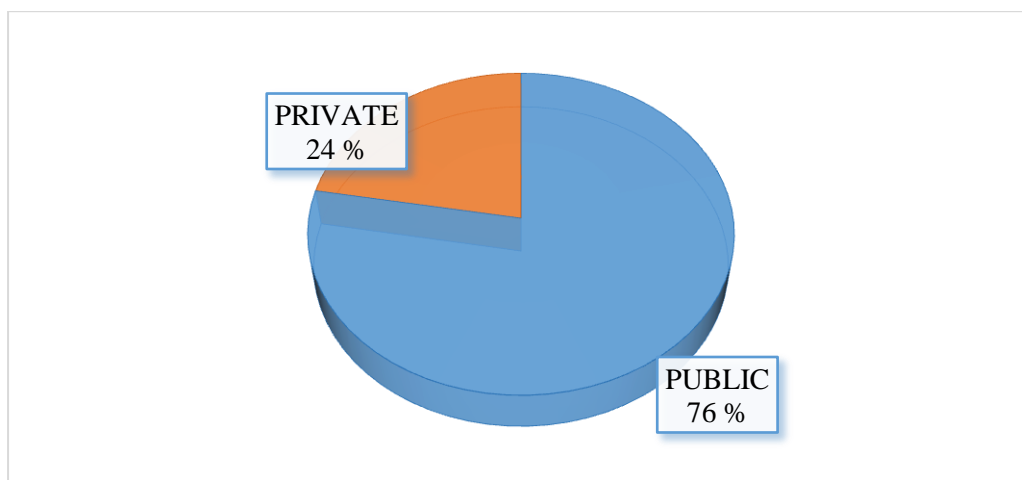
Out of the 353 institutions which responded to the exercise, 338 (95.8%) had registration details indicated while the rest (4.2%) had no registration details. The bodies which registered the institutions were; Ministry of Education, Science and Technology (MoEST), National Industrial Training Authority (NITA), Ministry of Youth Affairs and Sports (MOYAS), Technical, Vocational, Educational and Training Authority (TVETA) ,Ministry of Labour, Social Security and Services (MLSSS) and Commission for University Education (CUE).



A higher percentage of the institutions were registered by Ministry of Youth Affairs and Sports (36 %) majority of which were from Western, Central Rift and Lower Eastern regions. In Western region alone, 93% of the institutions were registered by MOYAS while only 7% were registered by MoEST. Moi University in Uasin Gishu County and Mount Kenya University campuses in Kisumu and Nyeri Counties were registered by the Commission for University Education (CUE).Two institutions (0.6%) were registered by MLSSS while TVETA and CUE each registered 2% of the technical training institutions.

### 2.3 Ownership status

Training institutions visited were either privately owned or public utilities. 24 % of the institutions were privately owned while 76 % were owned by the public.

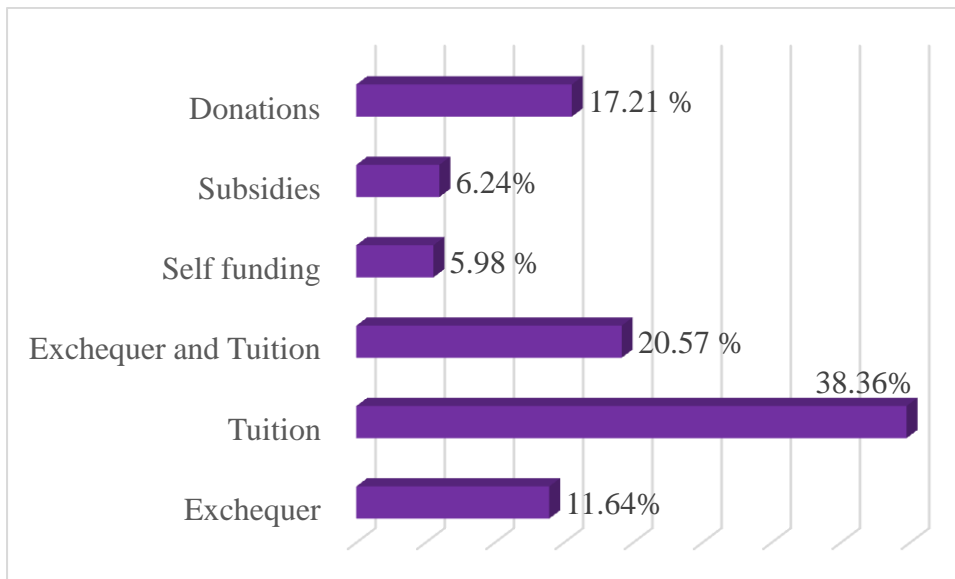


In terms of ownership distribution, majority of institutions which were owned by the public were from Western region (96%) while majority of the privately owned institutions were from Coast region (71%). The table below shows ownership distribution of the technical institutions per region;

Region	% Public	% Private
Nyanza	60 %	40 %
Nairobi	66.7 %	33.3 %
Coast	29 %	71 %
North Rift	83 %	17 %
Mount Kenya	70 %	30 %
Western	96 %	4 %
Central Rift	95 %	5 %
Lower Eastern	91 %	9 %
Upper Eastern	94 %	6 %
<b>Overall Percentage</b>	<b>76 %</b>	<b>24 %</b>

## 2.4 Funding

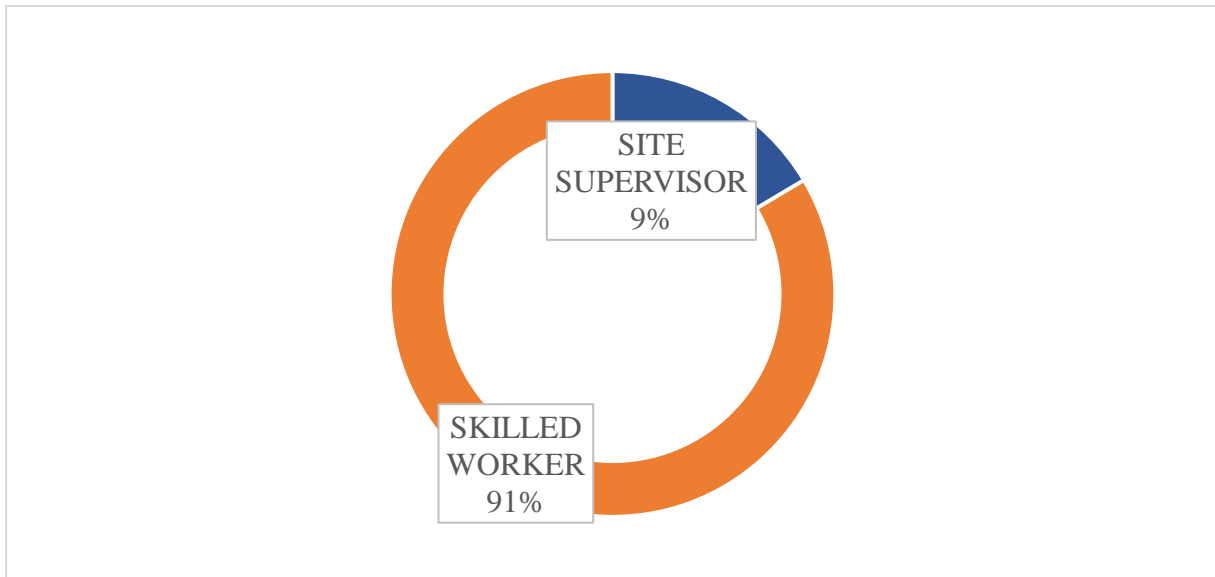
The institutions had various sources of funds to facilitate their day to day operations. These sources were; exchequer, tuition fees, donations, institutions' own resources and subsidies from respective county governments.



Majority of the institutions were funded through tuition fees paid by the students (38.36%) while a smaller proportion (5.98%) used their own investments to fund their activities. 6.24% of the institutions were subsidized by both their respective county governments. County governments which subsidized their technical training institutions were; Nairobi (1 institution), Kakamega (21 institutions), Machakos (5 institutions), Nakuru (4 institutions) and Vihiga (7 institutions). Other counties should also act in the same manner and the National government should increase its level of exchequer to the institutions in order for them to have enough funds. Private technical institutions which were nonprofit received their funds mainly through donations and charitable organizations which contributed 17.21% of the funding.

## 2.5 Course Levels

All the technical training institutions which responded offered their respective courses in Artisan, Craft, Certificate, Diploma, Higher Diploma, Undergraduate degree and Masters levels depending on their technical capabilities and other resources.



From the chart above, it can be seen that a higher proportion of the technical courses were offered at skilled construction worker level (91%). This level comprised of Craft, Artisan, Certificate and Trade tests (Grade I, II and III). Only 9% of the courses were offered at skilled construction worker level which comprised of Diploma, Higher Diploma and Degree courses. The Degree Courses were only offered by Universities and their constituent colleges i.e. Moi, Mount Kenya and Machakos University College. Courses offered at both Undergraduate and Master's Degree levels were the least representing 0.6% of the total number of courses. Further findings revealed that Carpentry/Joinery, Masonry and Electrical installation were the prevalent courses at Certificate, Artisan and Trade test levels. It is also important to note that Electrical installation was offered by technical institutes at all levels. Below are summary tables showing different courses offered at respective levels and their frequencies;

### 2.5.1 Courses for Skilled Construction Worker Level

The table below shows total number courses offered by all the institutions at skilled construction worker level (at Artisan, Craft, Certificate and Trade tests)

Course Name	Total Number of each course in all the institutions	Percentage
Carpentry and joinery	261	22.68 %
Electrical installation	192	16.68 %
Masonry	172	14.94 %
Welding and fabrication	158	13.73 %
Motor vehicle mechanics	112	9.73 %
Building technology	96	8.34 %
Plumbing	85	7.38 %
ICT	21	1.82 %
Mechanical engineering	10	0.87 %
Automotive engineering	9	0.78 %
Fitter turning	8	0.70 %
Refrigeration	6	0.52 %
Civil engineering	5	0.43 %
Power mechanics	4	0.35 %
Solar PV technology	3	0.26 %
Painting and decoration	3	0.26 %
Land survey	3	0.26 %
CCTV installation	1	0.09 %
Plant operator	1	0.09 %
Routine maintenance	1	0.09 %
<b>Total</b>	<b>1151</b>	<b>100%</b>

Carpentry and joinery was the most offered course at skilled construction worker level (Artisan, Craft, Certificate and Trade tests) in all the institutions. There were 261 Carpentry and Joinery courses which represented 23% of all the courses. Solar PV technology, Painting/decoration, Land Survey, CCTV Installation, Plant operator and Routine maintenance were the least number of courses offered.

### 2.5.2 Courses for Construction Site Supervisor Level

The table below shows total number courses offered by all the institutions at Construction Site Supervisor level (Diploma, Higher Diploma, Undergraduate degree and Master's degree level)

Course Name	Total No. of Each Course	Percentage
Civil Engineering	18	14.8 %
Electrical Engineering	15	12.3 %
Electrical Installation	15	12.3 %
Mechanical Engineering	13	10.7 %
Building Technology	12	9.8 %
Automotive Engineering	11	9.0 %
Quantity Survey	7	5.7 %
Water Technology	7	5.7 %
Architecture	7	5.7 %
Land Survey	6	4.9 %
Telecommunication Eng.	3	2.5 %
Cartography	2	1.6 %
Photogrammetry	2	1.6 %
Irrigation and Drainage Eng.	1	0.8 %
Highway Engineering	1	0.8 %
Map Reproduction	1	0.8 %
Welding and Fabrication	1	0.8 %
<b>Total</b>	<b>122</b>	<b>100%</b>

## 2.6 Level of enrollment

### 2.6.1 Skilled Construction worker Level

The technical institutions offered a variety of courses depending on their capacities in terms of classrooms, teaching staff, workshops, laboratories essential equipment used during the training. However, the enrollment in the institutions was not to full capacities and the table below shows the combined student capacities and current enrollment per course.

Course Name	Total available Capacity	Current Enrollment	Shortfall	Percentage Shortfall
Carpentry and joinery	7427	2713	4714	63.47 %
Electrical installation	7698	5433	2265	29.42 %
Masonry	5459	3036	2423	44.39 %
Welding and fabrication	4828	2267	2561	53.04 %
Motor vehicle mechanics	4243	3021	1222	28.80 %
Building technology	3326	1926	1400	42.09 %
Plumbing	2862	1605	1257	43.92 %
ICT	1202	581	621	51.66 %
Mechanical engineering	1813	1323	490	27.03 %
Automotive engineering	505	359	146	28.91 %
Civil engineering	1277	1254	23	1.80 %
Power mechanics	176	133	43	24.43 %
Solar PV technology	130	67	63	48.46 %
Painting and decoration	109	24	85	77.98 %
Land survey	45	18	27	60.00 %
Routine Maintenance	30	0	30	100.00 %
Tiling	10	3	7	70.00 %
Plant operator	100	0	100	100.00 %
<b>Total</b>	<b>41240</b>	<b>23763</b>	<b>17477</b>	<b>42.38%</b>

From the table, it can be clearly seen that most of the students at Construction Worker level were enrolled in Electrical Installation course (5433) which represents 22.86% of the total enrollment. This strongly agrees with the earlier finding that Electrical Installation course was offered by the institutions at all levels.

Enrollment in Masonry, Motor vehicle Mechanics and Carpentry follow that of electrical installation in the same order representing 12.8 %, 12.7 % and 11.4 % of the total enrollment respectively. These courses were also prevalent at all levels except that of Higher Diploma and Degree.

It can also be seen from the table that no course was over-enrolled and majority of the courses had a student shortfall of between 20% and 50%. Considering available capacities of each course, civil engineering course was almost enrolled to full capacity since it had a mere shortfall of only 1.80 %. There were no enrollment in Routine Maintenance and Plant Operator courses in the institutions where those courses were offered.

In general, the total enrollment shortfall was 42.38 % at skilled construction worker course levels in all the institutions. This implies that their level of enrollment was 57.62 % which is slightly above average.

### 2.6.2 Construction Site Supervisor level

The table below shows the level of enrollment in construction site supervisor course levels;

Course Name	Total Available Capacity	Current Enrollment	Shortfall	Percentage Shortfall
Telecommunication Eng.	380	222	158	41.58 %
Cartography	115	85	30	26.09 %
Photogrammetry	150	48	102	68.00 %
Irrigation and Drainage Eng.	210	75	135	64.29 %
Highway Engineering	120	111	9	7.50 %
Map Reproduction	90	78	12	13.33 %
Welding and Fabrication	894	562	332	37.14 %
Architecture	685	432	253	36.93 %
Quantity Survey	395	299	96	24.30 %
Mechanical Engineering	145	86	59	40.69 %
Water Technology	205	117	88	42.93 %
Land Survey	60	37	23	38.33 %
Welding and fabrication	225	70	155	68.89 %
Electrical Engineering	440	308	132	30.00 %
Electrical Installation	1370	1005	365	26.64 %
Building Technology	1208	848	360	29.80 %
Civil Engineering	335	213	12	36.42 %
<b>TOTAL</b>	<b>7027</b>	<b>4596</b>	<b>2431</b>	<b>34.60 %</b>

From the table above, it can also be seen that Electrical Installation course had the highest enrollment(1005) representing 21.9 % followed by that of Building Technology, Welding/fabrication and Architecture representing 18.5 % 12.2 % and 9.4 % respectively. Taking into consideration the available capacities for each course in the construction site supervisor level, Welding/Fabrication was the most under-enrolled course with a student shortfall of 68.89 %. Generally, the cumulative shortfall for construction site supervisor courses (Diploma, Higher Diploma, Degree) was 34.60%.This indicates that the level of enrollment for construction site supervisors was 65.4 % which was higher compared to those of construction worker level (57.6%)

The correlation coefficients for total enrollments against the available capacities of construction worker level courses and site supervisor course levels are given as;

$$r_1 = 0.9431 \text{ (for construction worker level)}$$

$$r_2 = 0.9885 \text{ (for site supervisor level)}$$

The coefficients of determination for the two levels can also be determined by;

$$r_1^2 = 0.9320^2 = 0.8894$$



This implies that 88.94 % of the total variation is explained by the linear relationship between the total available capacity and the current enrollment in all the construction worker level courses. The rest (11.06 %) is explained by other factors.

Similarly,

$$r_2^2 = 0.9885^2 = 0.9771$$

This also implies that 97.71% of the total variation is explained by the linear relationship between the total available capacity and the current enrollment in all the construction site supervisor level courses.

### **2.7 General Course Completion Rate**

Comparing the values of student enrollment as at the time when the exercise was conducted with that of the students trained in the last 5 years, most of the courses failed to demonstrate a linear trend. From this scenario, it can be deduced that most of the trainees do not complete their courses once they are enrolled or there may be an inconsistency in the enrollment due to lack of interest among the trainees. However, majority of the institutions stated that most of their students drop out before the course is complete. The table below show probability distribution of course completion among the trainees;

Course Name	Current Enrollment	No. of Graduates in the last 5 years	Probability of course completion
Masonry	3004	8804	58.62
Carpentry	3098	8368	54.02
Plumbing	1639	4418	53.91
Welding	3267	6100	37.34
Motor vehicle Mechanics	3021	8026	53.13
Quantity Survey	319	322	20.19
Architecture	432	326	15.09
Mechanical Eng.	1323	6493	98.16
Automotive Eng.	359	1599	89.08
Civil Eng.	1652	2192	26.54
Electrical Eng.	1317	5153	78.25
Electrical installation	4319	11332	52.48
Electronics	848	2463	58.09
<b>Painting</b>	<b>17</b>	<b>192</b>	<b>100 %</b>
Road Construction	78	334	85.64
Water Engineering	117	250	42.74
CCTV installation	7	20	57.14
Solar installation	48	97	40.42
Building Technology	2901	4142	28.56
Building and Construction	731	646	17.67
ICT	581	2132	73.39
Highway Eng.	111	200	36.04
Telecommunication Eng.	222	255	22.97
<b>Fitter turning</b>	<b>78</b>	<b>593</b>	<b>100 %</b>
Map reproduction	37	74	40.00
Land survey	562	878	31.25
Refrigeration	221	947	85.70
Cartography	85	123	28.94
<b>Tiling</b>	<b>3</b>	<b>15</b>	<b>100 %</b>
<b>TOTAL</b>	<b>30397</b>	<b>76494</b>	<b>50.33 %</b>

From the above distributions, it suffices to say that a student enrolled to Painting/ decoration, Tiling or Fitter turning will complete the course upon the first admission at any point in time. Other courses which had high chances of completion were Mechanical engineering (98.16%), Automotive Engineering (89.08%), Road construction (85.64%) and Refrigeration/Air Conditioning (85.70%).

Courses which had very low chances of completion were Quantity Survey (20.19%), Building and Construction (17.67%) and Architecture (15.09%)

Considering all the students enrolled to the technical institutions, the probability that they will complete their respective courses was 0.5033. This implies that if all the students were to be

enrolled at the same time, then only 50.33 % of them would complete their respective courses.

The total number of trainees as at the time when the exercise was carried out was 30,397 while the total number of graduates in the last 5 years was 76,494. Therefore correlation coefficient between the number of graduates in the last 5 years and the current enrollment for all the course was **0.9374**. This implies that there was a strong positive correlation between students trained in the last 5 years and the current number. Assuming linearity, it is expected that this trend would continue to the next 5 years and, therefore, the number of trainers in the next 5 years will increase significantly.

*(The above values were based on the assumption that student admissions were the same every year and that all the institutions were fully operational over the last 5 years with other factors remaining constant)*

## **2.8 Discontinued Courses**

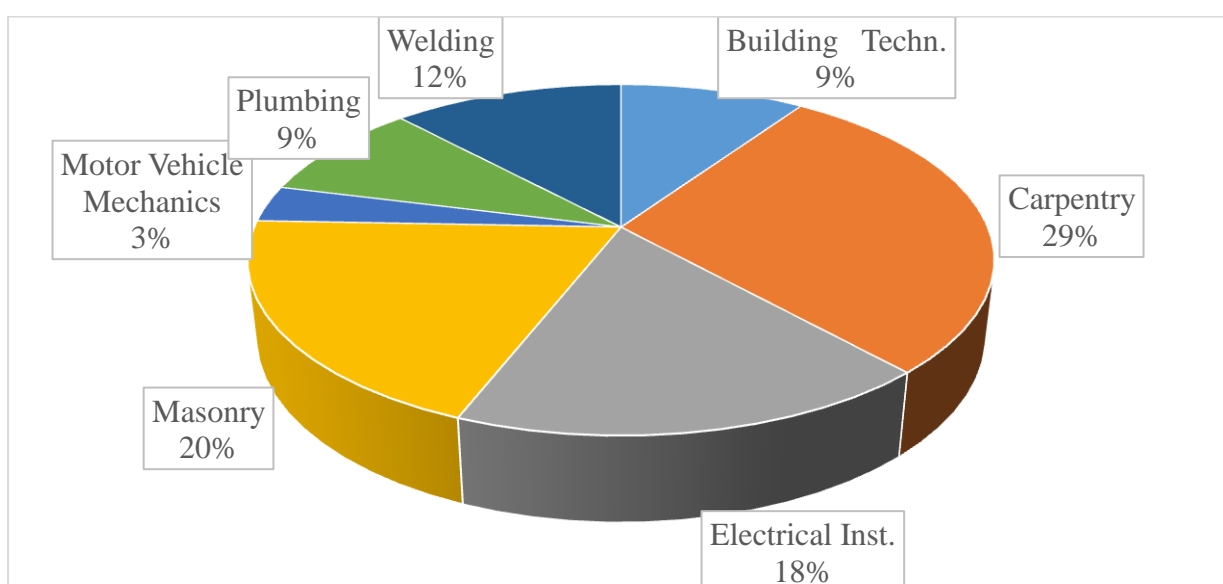
A number of training institutions had some of their courses discontinued for various reasons which included; lack of training equipment/workshops, shortage of training instructors, shortage of trainees and transition/change in curriculum. A total of 33 institutions (9.3%) had some of their courses discontinued. Among the discontinued courses, Carpentry/Joinery was the highest representing 64.83 % of the total discontinued courses and this was mainly due to lack of training instructors. Stringent measures are therefore needed to be taken in order to ensure that all the technical institutions are equipped with enough trainers and equipment in order to cater for the training needs.

## **2.9 Workshops**

In order to equip learners with sound practical skills, workshops are necessary and it is the responsibility of all the technical training institutions to ensure that these facilities are available in their centres. From the data, 316 institutions (89.5 %) had workshops used for various courses. However, most of the workshops were not well equipped with enough tools or machines used for the training. Out of the 316 institutions which had workshops, only 211(59.8%) had well equipped workshops while the rest had insufficient machines. Also, 6 institutions used tree shades as their workshops since they had no buildings which could be used as workshops. The table below shows a summary of institutions with workshops per region.

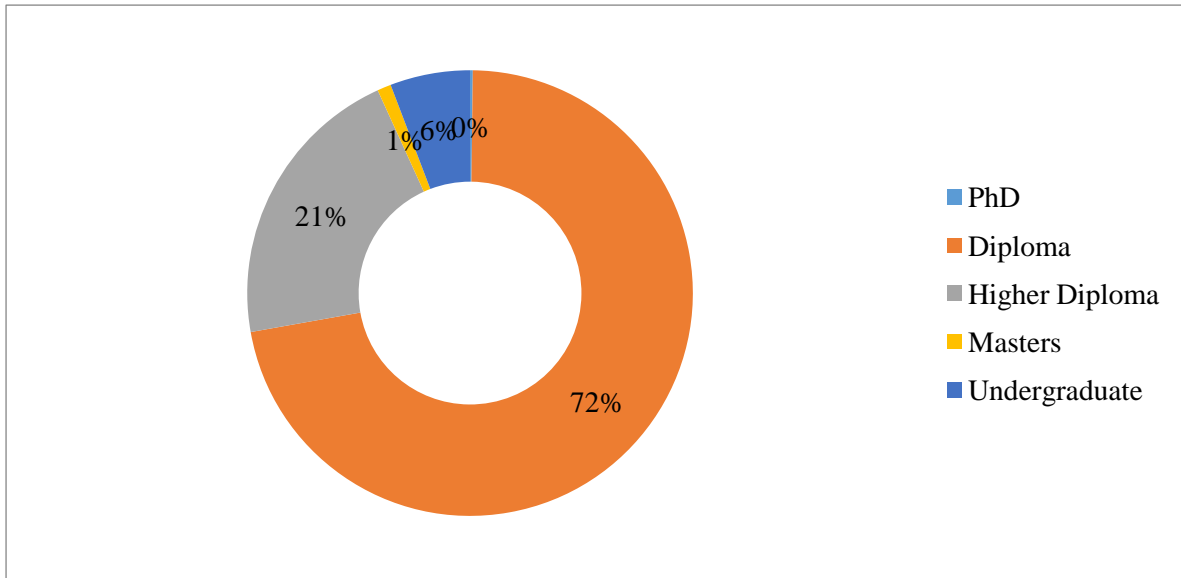
Region	No. of Institutions	No. of Institutions with workshops	No of Institutions with well-equipped workshops
Nairobi	19	19	12
Western	94	81	54
Nyanza	18	36	16
North Rift	18	14	8
Mount Kenya	14	6	4
Coast	12	8	5
Central Rift	60	55	42
Lower Eastern	74	73	57
Upper Eastern	24	24	13
<b>Total</b>	<b>353</b>	<b>316</b>	<b>211</b>

The workshops used by the institutions were mainly for Building Technology, Carpentry/joinery, Electrical Installation, Motor Vehicle Mechanics, Plumbing and Welding/fabrication courses. Carpentry workshops had the highest representation of 29% while Motor Vehicle Mechanics had the lowest representation of 3%.

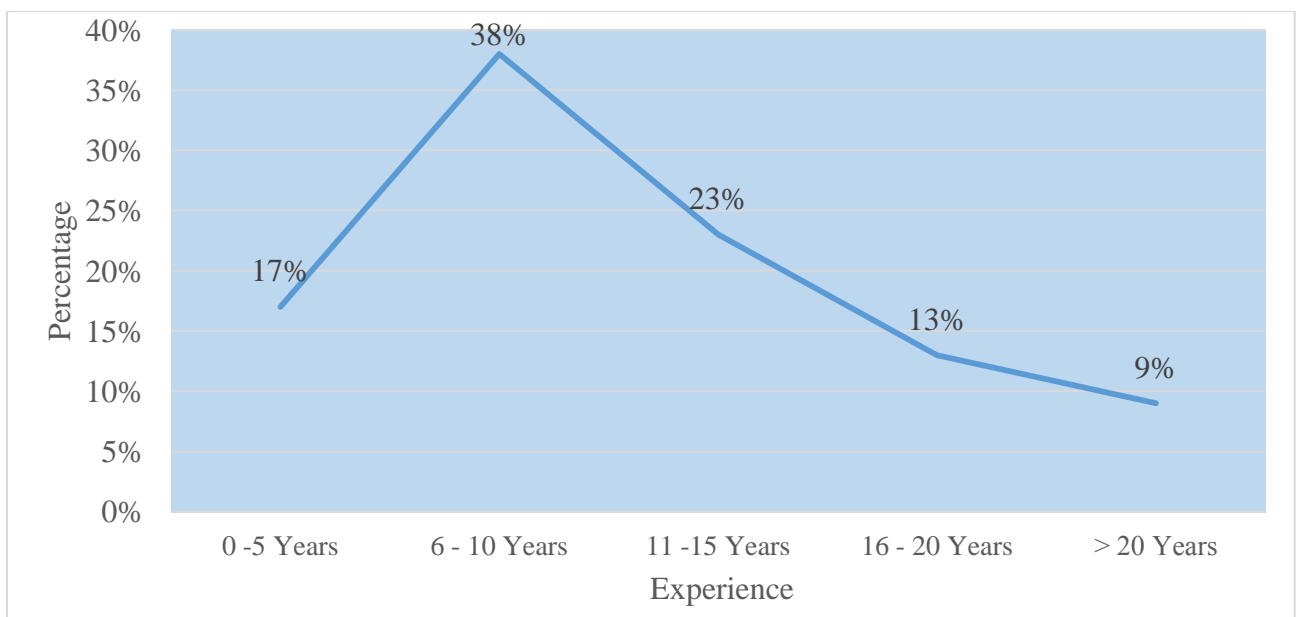


### 2.10 Trainer Competencies

The trainers in the technical institutions had varied qualifications ranging from Certificate to PhD level as their primary qualifications. In total, there were 2047 trainers in all the institutions and a higher percentage of them had Diplomas as their primary qualifications (29.4%). Only 0.2 % of the trainers had PhDs and they trained mainly at Universities. The only trainer who had a PhD from the technical institutes was from the Kenya Institute of Highways and Building Technology (KIHBT).



Based on experience in the teaching industry, 38% of the trainers had between 6 and 10 years of experience in the industry while only 9% of them had more than 20 years in service. The graph below shows a summary of the level of experience for the trainers.



In addition, only 43% of all the trainers had additional qualifications in training. This clearly shows that there is need to sensitize the instructors on the need to pursue studies at higher levels in order to ensure quality training in the institutions.

Taking into consideration the total number of trainers (2047) against student population in the institutions as at the time when data was collected (30397), the trainer – student ratio was found to be 1:14. This implies that on average, one trainer handles 14 students which is fairly significant. Therefore, it can be concluded that in terms of workforce, the institutions have sufficient capacity to train the students but they only need to build their skills to higher levels.

### **2.11 Industrial attachment requirements**

Out of the 353 training institutions, 326 (92%) had industrial attachment requirements in their respective courses. It is therefore apparent to ensure that they embrace the need for industrial attachment provision in order to assess the level of skills acquired by the learners before they join the construction industry.

### **2.12 Challenges faced by the institutions**

The following were some of the challenges faced by the institutions visited;

- a) Limited sourcing for training Equipment.
- b) High cost of machine maintenance.
- c) High cost of admission cost for some courses particularly Map reproduction, land survey, photogrammetry and remote sensing.
- d) Ever changing new technologies. Most institutions use obsolete technologies.
- e) Lack of Human Resource development.
- f) Limited Upgrade to new emerging skills.
- g) Limitations of the operations due to inadequate funding. Most of the institutions depended on tuition fees for their funding which were meagre.
- h) Trainees do not access industrial attachment and in some cases, it was not well coordinated.
- i) Lack of practical component in the Upper level courses.
- j) Lack of joint ventures between the industry and the institutions.
- k) Technical courses running under different ministries offering different curriculum.
- l) Lack to motivation to train in the skill sets in the industry.
- m) Negative mindset and attitude regarding the artisan courses.
- n) Lack of enough trainers in the technical areas. Some institutions had discontinued some of their courses due to lack of instructors.
- o) The curriculum is exam oriented rather than skill oriented.

### 3.0. CONCLUSION

It is necessary to strengthen the partnerships between the industry regulator and the training institutions in Kenya as a matter of priority, for the construction industry to benefit from the skills. The following were the conclusions made;

- 1) There are few and unevenly distributed technical training centers. Most of the training institutions are found in Western Kenya, especially in Kakamega County.
- 2) There is a consistent decline in the quality of training offered in training centers as a result of declining number of qualified trainers since most trainers lack the additional qualification training skills. However it was also noted that some trainers have certificate and diploma level as the primary professional qualification.
- 3) Most institutions are lacking modern and efficient machine and equipment while there is a lack of relevance in skills taught that match with occupational and social realities present in today's economy.
- 4) Some training centers continue to teach skills that no longer have a market and ignore those that do have, an example being the ignorance of artisan/craft courses which are important to the construction industry.
- 5) Due to emphasis put on professional courses and other factors there is under-enrolment into technical courses resulting in a fewer number of people with technical skills.
- 6) The level of enrollment in all the institutions stood at 62.01%. Training centers also suffer from under-funding as there are normally very small allocations of funds to technical training centers in the budget.
- 7) Majority of the institutions offered between 4 and 8 technical courses, most of which were electrical installation, masonry, carpentry/joinery and motor vehicle mechanics. KIHBT in Nairobi County and RIAT in Kisumu County were the only institutions which offered a variety of courses.
- 8) Apart from construction related courses, ICT, fashion design and garment making were the dominant courses offered by most of the institutions in Nyanza and Western Kenya.

### 4.0 RECOMMENDATIONS

- 1) Several steps should be taken in order to improve the technical and vocational education, there should be promotion of partnerships with business, provision of incentives for financing, creation of skill-based certification systems and decentralization and encouragement of the development of the construction industry.
- 2) There is need to create awareness of the artisan/craft courses and improve training facilities.
- 3) It is imperative to stress that the objective of practical studies in school should not be vocational training as articulated earlier but rather the acquisition of manual dexterity and practical skills as an integral part of general education.
- 4) It will be necessary to revise technical training so that it reflects the needs of industry and the labor market as well as promote a sustainable link between training and the world of work, industrial attachment should be strengthened through partnerships with the private sector and development partners as well as the industry regulators.

- 5) Principals of technical institutions should be highly qualified individuals in the relevant technical areas and should also have some administrative skills. Goal-setting or some kind of (theoretical) framework that ties in with the vision and mission of the institution and its strategic plan are an asset in helping the institution to carry out its functions.