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Sub Theme: Use of Assessment in Decision Making

Paper Title: Simulation of Use of Technical and Vocational Education and Training (TVET) Education Assessment Data for Development Policy Decision Making.

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Technical and Vocational Education Training (TVET) assessment presents a unique opportunity for Kenya's skills development to solve unemployment among the youth as well as achieve the industrial development envisaged in Kenya's Vision 2030. The adoption of competence based assessment of skills acquired in TVET holds immense potential in ensuring that youth in TVET programs acquire the requisite skill competence and are adequately prepared for the job market as employees or entrepreneurs. This would reduce the level of youth unemployment which stood at 17.4% in 2015. However, the use of TVET assessment data to guide policy decision-making has not been exploited as evidenced by the paucity of literature in the area in Kenya. The Kenya National Examination Council (KNEC) conducts assessment of TVET trainees at four levels of Artisan, Certificate, Diploma and Higher Diploma. Practical skills assessment forms thirty percent of the final assessment grade and TVET courses are practical oriented. A descriptive research design is adapted and using data from Technical examination enrolment and performance from 2014-2018, TVET Act of 2013, TVET education and educational assessment policy documents, the paper explores the extent to which and how examination enrollment and assessment data could be used in decision making. The paper also opens debate on the principal issues, policy reforms and their implementation while documenting the impacts of these reforms on TVET beneficiaries. The factors impeding TVET assessment are explored together with solutions that have been implemented to surmount such challenges in newly developed economies like the "Asian Tigers". Issues of expansion of access, equity, relevance and quality of TVET are also brought to fore as they are significant if TVET is to leverage industrial development in Kenya. This paper forms an advocacy premise to the policy makers on TVET education and assessment for youth involvement in industrialization to attainment of the Big 4 action plan of the current government of Kenya.

Key Words: Policy, TVET, Education and Assessment

1.0 Introduction

1.1 Background

Technical and Vocational Education Training (TVET) presents a unique opportunity for Kenya's skills development for the youth in the wake of the youth bulge. Indeed the Kenya vision 2030 (RoK 2007) envisages TVET as a driver to industrialization for economic development. Further, literature reveals that TVET has the ability to solve unemployment among the youth which is a problem many developing countries are grappling with (Manda, Mwambu & Kamenyi, (2002) and Nyerere (2009)). However, the envisaged benefits of TVET may not be fully achieved if TVET provision is not premised on evidence based policy formulation with an aim of reaping from the pool of skills acquired and mapping these to the industries and facilitation of self-employment.

Youth in developing countries face a significant challenge in attaining decent employment. This is caused by the rise in population which has resulted in reduced employment opportunities. There is now great demand for technical skills that can lead to self-employment as the informal sector as well as the traditional rural sector has been the source of employment for many youth joining the work force in the last decade. Technical Vocational Education and Training (TVET) has been identified as a means to equipping youth with these requisite skills. In as much as apprenticeship can facilitate skill acquisition, TVET is preferred as it allows for work based learning, recognition of the skills gained and certification. Apart from, training of youth joining the work force, TVET also provides for enhancing of skills for the low skilled people to increase productivity and wage levels.

In addition to interest in TVET for equipping youth with skills for self-employment, the 3rd world countries have shifted focus to TVET for industrialization. For instance, Kenya in its economic blue print, vision 2030, identifies TVET as a possible driver to industrialization. The current government has also set the big four development agenda as manufacturing, food security, universal health coverage and affordable housing all of which are bound to depend on skills acquired from TVET. These envisaged benefits have seen a marked expansion of vocational and technical training institutions as well as equipping the TVET institutions.in Kenya. In addition to this the Kenya government has put in place pro-poor policies to increase access to TVET institutions and is capacity building for TVET trainers to adopt new technology and improve the quality of instruction.

The role of TVET assessment data can therefore not be overemphasized as this provides insights on the levels of qualifications achieved and the number of youth graduating to either create or take up jobs in the world of work. Extrapolating the data on enrollment of candidates for TVET examinations by use of time series provides critical information for resource provision and filling in gaps in training for maximum benefit from TVET. The purpose of this paper is therefore to apply TVET assessment data to identify opportunities and probable policy gaps that could

benefit from the use of assessment data to inform decisions making. This would ensure TVET feeds into industrialization and solution of youth unemployment in Kenya.

The implementation of the TVET act has resulted in a marked increase of vocational and technical training institutions in Kenya with technical training institutes being built and equipped in most of the sub counties across Kenya. The number of TVET institutions rose substantially by 50.9 per cent from 1,300 in 2016 to 1,962 in 2017 (KNBS, 2018). Further, policies have been formulated to remove the financial burden of TVET from households by providing sponsorship for the TVET students. Despite this efforts made by the Kenya government, TVET is among other shortcomings criticized for not providing feedback from the employers to training institutions leading to training that is supply rather than demand driven. The TVET graduates have been criticized to lack hands on experience and have poor work attitudes besides being inflexible to change (Tarno, Simiyu, Kitainge & Rono, 2017). This is in spite of the expectation that TVET graduates should be immediately absorbed and operational in the work place.

In addition to the criticism described in the foregoing paragraphs TVET in Kenya has also been found to have some marked shortcomings. For instance, facilities and equipment used in TVET institutions do not march the sophistication of facilities and equipment found in the work places where the graduates are expected to be absorbed. Further, TVET graduates have been found to lack relevant skills for the work place as the skills needs of industries and business organizations have not been considered in the development of content for TVET training (Sang, Muthaa & Mbugua, 2012). These challenges point to a need for training policies to be urgently re-viewed to ensure that training is demand driven and can deliver for Kenya a reduction in unemployment and industrialization by the year 2030. .

To this end, the review of training policy for TVET requires accurate and reliable data as well as information, which would facilitate evidence based decision making. One major source of data and information for such decision making is the TVET assessment data from the Kenya National Examinations Council (KNEC). KNEC is an examination board which develops examinations, administers and awards certificates for various national summative examinations for placements and certification purposes at different levels in the education sector. The data and information handled during these examinations is massive and relates to the whole country, hence would provide for valid generalization for the TVET needs of the whole country as well as counties. The assessment results from these examinations are consumed by a wide network of stake holders who includes the candidates, parents, teachers, curriculum designers, Ministry of Education and government policy makers. Various employers too are interested in the results of these national examinations for TVET.

1.2 Statement of the problem

Decision making and policy formulation relies heavily on availability of accurate, valid and reliable information. TVET enrollment and assessment data is critical in guiding government and industry on skill development challenges, training and resource provision gaps. Of critical importance in the decision making process is the understanding and interpretation of available

information to guide the decision making process. Kenya's industrialization and solution of youth unemployment lies in the formulation of good policy which depends heavily on informed decision making based on TVET enrollment and assessment results. The presentation and application of enrollment data and assessment in many situations may result in ineffective policy decisions leading to wastage of resources and failure to achieve the desired outcomes. This study aims at applying available Technical examination enrollment and assessment data to decision making and policy formulation with the ultimate goal of industrialization and reduction of youth unemployment.

1.3 Objectives of the study

The following are the objectives of the study:

1.3.1 To establish the enrollment trends in Technical examinations over the past five years disaggregated by course with regard to requirements for industrialization with a view to improve decision making based on tenets of TVET training for industrialization and job creation

1.3.2 To establish the enrollment trends in Technical examinations over the past five years disaggregated by gender with regard to gender equity in provision of TVET

1.3.3 To establish the examination pass rates over course over the last five years.

1.3.4 To determine the implications of technical examinations' enrollment trends and opportunities provided on the achievement of industrialization and youth employment in Kenya, when as compared to the Asian tigers?

1.4 Research questions

The following are the specific research questions of the study:

1.4.1 What have been the enrollment trends in Technical examinations in the last five years with regard to courses?

1.4.2 What have been the enrollment trends in Technical examinations in the last five years with regard to gender?

1.4.3 What have been the examination pass rates over course over the last five years?

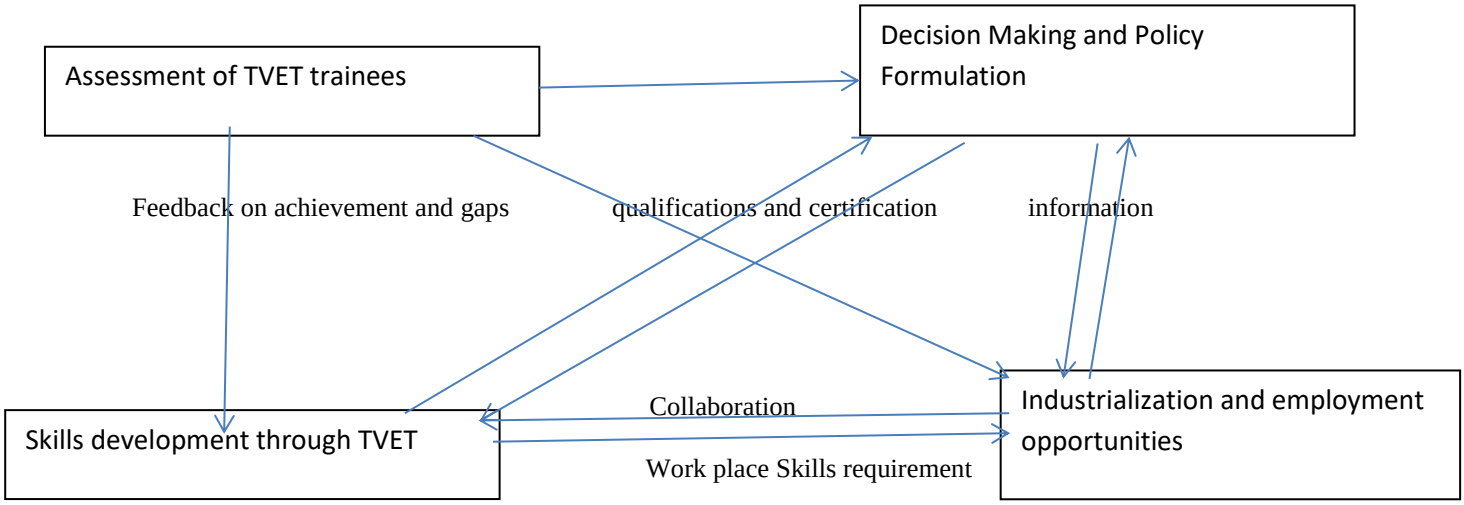
1.4.4 What are the implications of the trends observed and opportunities provided to the achievement of industrialization and youth employment in Kenya, when viewed from achievements of the Asian tigers?

1.5 Scope and Limitations of the study

The data for this study was collected from the records of Kenya National Examinations Council (KNEC) targeting the population of all the candidates' in the country who sat Technical

examinations in the years 2014 to 2018. The five years were considered adequate to enable generalization as they would represent the cohorts of secondary school years for over four years. Further, the massive number of courses and candidature would complicate manipulation of data within the resource constraints for this study, if more years were considered.

Conceptual Framework



2.0 Literature review

2.1 Global views of TVET

On the global front Raza and Khalid (2017) in a study based in Pakistan found among other issues that there was need to improve funding for Technical Education, coordination of stakeholders in TVET provision and to update the curricula for TVET often. The study also found weak links between TVET training and the industries in which TVET graduates were expected to work and thus it was important that such linkages be formed to improve the quality of TVET. Similarly, another research study conducted by National Institute of Science and Technical Education, Islamabad for UNESCO, (2014) on TVET at secondary school level found weak linkage of TVET with industry. These findings are important to this study as they would guide in reviewing the use of enrollment data for policy decisions in the Kenyan TVET provision. This is especially with regard to the provision of market driven TVET provision.

Further Shah, (2013) opined that there was need for consultation in plan preparation for the purpose of meeting policy targets. In his opinion strategies for the realization of policy targets on TVET were not realistic. The current study aims at establishing the policy and decisions in place

concerning TVET in Kenya and based on available enrollment and performance data suggest possible improvements that would enable Kenya leverage the benefits of TVET for employment and industrialization.

2.2 Regional views of TVET

In a study carried out by Okwelle and Ayonmike (2014) to determine the opinion of TVET educators on the role of TVET for sustainable development it was revealed that enhancing the image of TVET requires; provision of a national policy framework, increased funding, strengthen collaboration of TVET provision with industry and strengthening guidance and counseling. Similar views had been expressed by Alam (2008), Dike (2009), Goel (2010), Okoye & Okwelle (2013). These findings are significant to this study because TVET provision in Kenya is premised on similar policy provisions and would therefore form a basis for comparison and critiquing TVET for sustainable development in Kenya.

With regard to TVET as a solution to unemployment among the youth, literature reveals that orientation of TVET to the job market and ensuring acquisition of competencies are essential in revitalizing TVET in Africa. The African Union (2007) emphasized re- strategizing by the Governments in Africa to promote skills acquisition through competency based training. This is envisaged to lead to employability of TVET graduates. The emphasis of TVET in Kenya is now shifting to competency based education and training and a discussion on the gains made from policy on types of training in this paper helps feedback into improvements of the policy to address market needs.

2.3 TVET provision in Kenya

One of the goals of the Kenya Vision 2030 (GOK 2007) is to increase the transition rates to technical institutions and universities from 3% to 8%. The vision also holds TVET as the key to industrialization. The Sustainable Development goal Number 4 requires that governments should increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship. To this end, the goal emphasizes the need to improve access by providing equitable access without compromising quality (Education 2030). This study looked at the enrollment in Technical courses disaggregated by gender thus providing information that could determine how far equitable access has been achieved

Kenya has made significant efforts to revitalize TVET. For instance there has been increased public spending on technical education and training that averaged 4.2 per cent of total education spending between 2012/13-2018/19. This budgetary increase is aimed at improving the number and capacity of TVET trainers, put up new training institutions, reduce the financial burden on TVET trainees by paying of capitation grants and funding of the development of a new curriculum among other concerns. With such radical changes taking place in Kenya it is important to have accurate information / data on enrollment and Assessment in TVET. This was found to be important by Lauglo (2006) who opines that for 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.

Even though the Kenyan government has increased funding towards TVET provision as shown in figure 1, more funding is required given that the technical courses offered by the institutions are capital intensive and require high technology equipment and skilled trainers. This is especially the case as TVET institutions have been found to use obsolete equipment that does not march that which is in the industries. The government introduced a training levy for private sector and public partnerships to support skills development in Kenya. However, this strategy for funding has not been successful and Kenya could benefit by borrowing best practices from models used by some East Asia countries such as Malaysia, Singapore and South Korea who have demonstrated successful adoption of policies to collect revenue for TVET training from private firms.

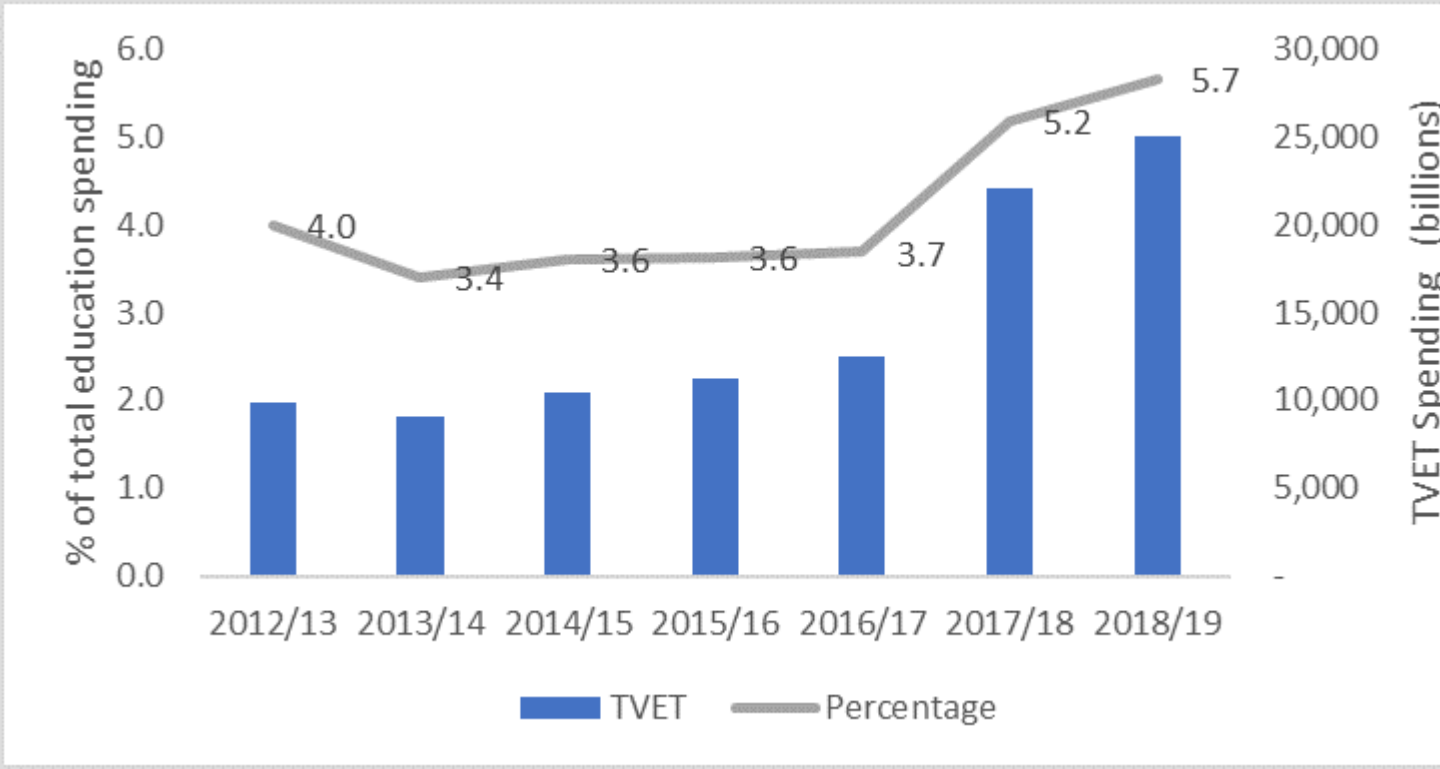


Figure 1: TVET Financing Trend (Ksh), (2012-2018)
Source: Ministry of Education

3.0 Research Methodology

3.1 Research design

A descriptive survey research design was adopted for this study. Inferences were made without direct intervention of the independent variables in which their manifestation had already occurred with candidates' already being enrolled for the Technical examinations. The research

study was carried out in order to establish information concerning the enrollment trends in TVET disaggregated by course, gender and region.

3.2 Study population

The target population of this study was all the candidates enrolled for technical examinations with KNEC in the four course levels of artisan, certificate, diploma and higher diploma over the period of 2014-2018

3.3 Sampling procedure and data collection

Purposive sampling was used in identifying courses especially for determining regional distribution of types of courses against the development agenda of the regions. The types of technical courses were categorized as engineering, building and applied science courses. All the data collected was obtained from the records of Kenya National Examinations Council (KNEC) by use of a template designed to show region, year, course and enrollment.

3.4 Data analysis

Descriptive statistics was used to analyze the huge quantitative data obtained Microsoft excel software. The huge data was grouped in course types, regions, gender before determining measures of central tendency like the mean, percentages and extrapolating means to present the expected enrollment for the year 2030 when Kenya envisages to have been industrialized. The reporting was done using tables, frequency polygons, Charts and graphs.

4.0 Results and discussion

4.1 Enrollment by course type

The study sought to establish the enrollment per course in Technical courses over the period 2014-2018. The findings are presented in Figures 1, 2 and 3.

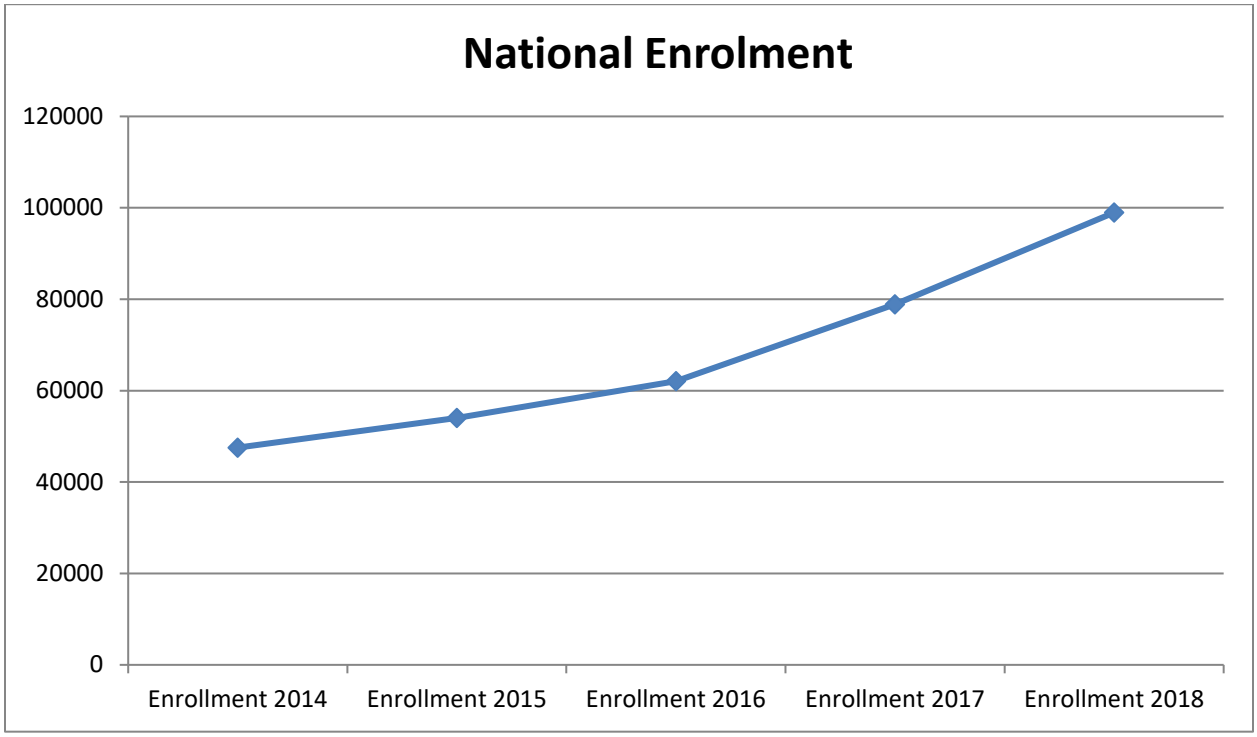
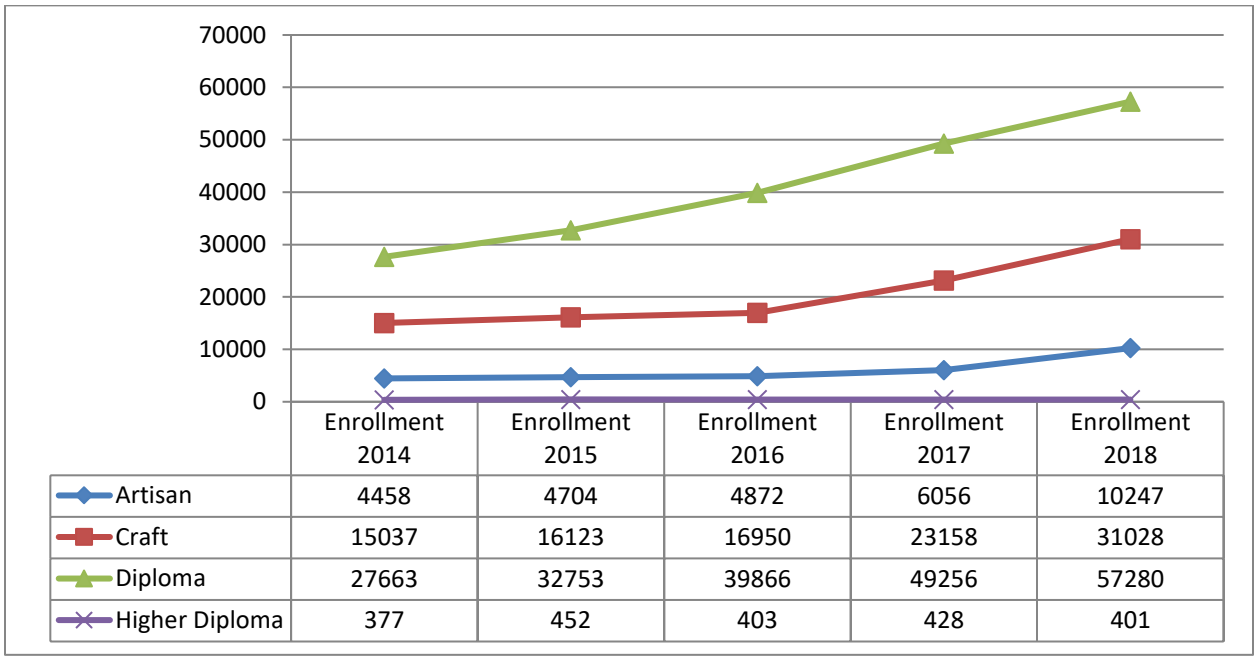


Figure1: Total Technical enrolment



	Enrollment 2014	Enrollment 2015	Enrollment 2016	Enrollment 2017	Enrollment 2018
Artisan	4458	4704	4872	6056	10247
Craft	15037	16123	16950	23158	31028
Diploma	27663	32753	39866	49256	57280
Higher Diploma	377	452	403	428	401

Figure 2: Enrolment per course type per year

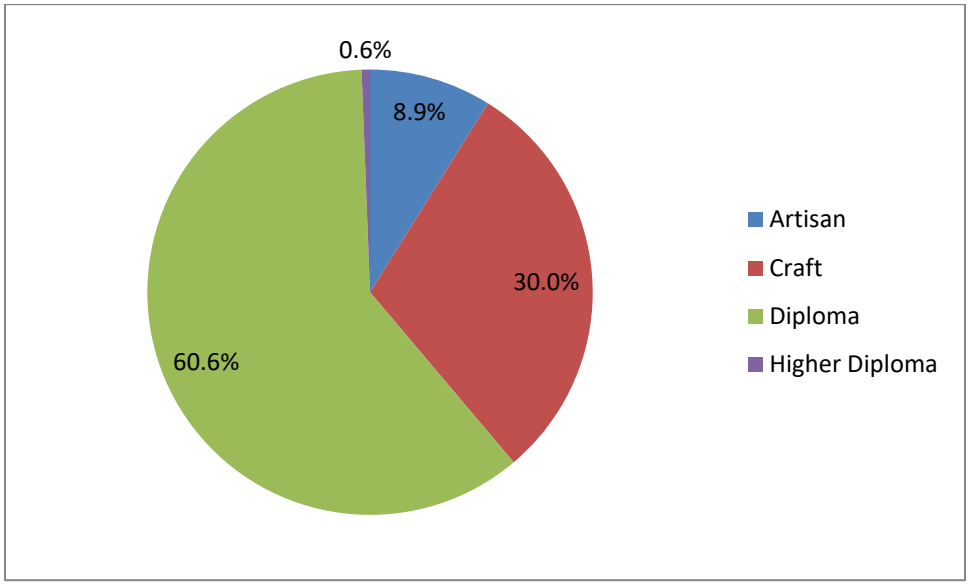


Figure 3: Percentage of enrolment per Course type over 5 years (2014-2018)

From Figures 1, 2 and 3 it is observable that enrollment over the last five years has been increasing. For instance, enrollment in Diploma courses has more than doubled from 27,663 in year 2014 to 57,280 in year 2018. It is also evident that the highest enrollment over the years has been registered in Diploma courses (60.6%) followed by craft certificate courses (30.0%) then artisan courses (8.9%). Higher diploma has registered the lowest enrollment over the years. This could be as a result of the shift from TEP to TVET in which most of the higher diploma courses have been faced out. Enrollment in diploma courses accounts for more than half of all the candidates enrolled. This is despite the need to have more artisans in industries and could impact on the skill development for industrialization in Kenya.

4.2 Extrapolated Enrollment Trends by Course Type

The study also sought to find out what the enrollment in technical courses by course type will be by the year 2030 in anticipation of industrialization of Kenya. The findings are presented in Figures 4, 5, 6 and 7 for artisan, craft certificate, diploma and higher Diploma courses respectively.

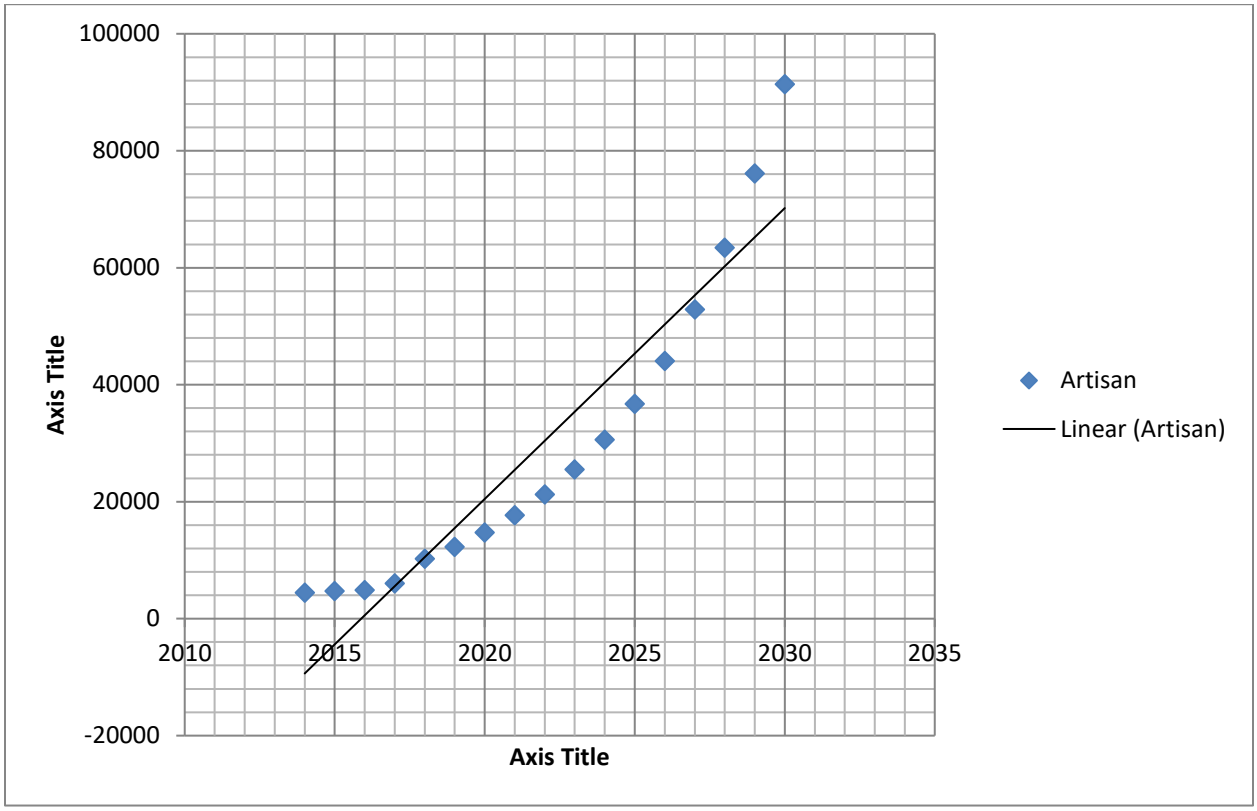


Figure 4: Extrapolated Enrollment Trends for Artisan course

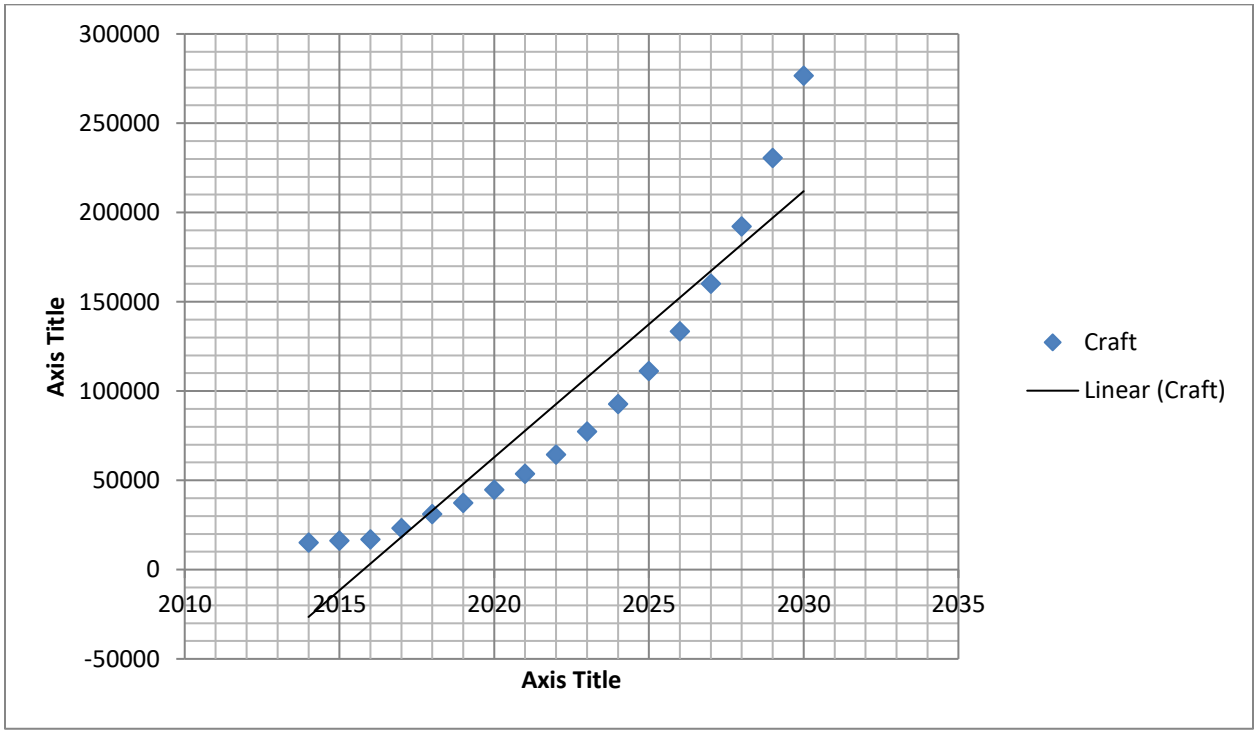


Figure 5: Extrapolated Enrollment Trends for craft certificate course

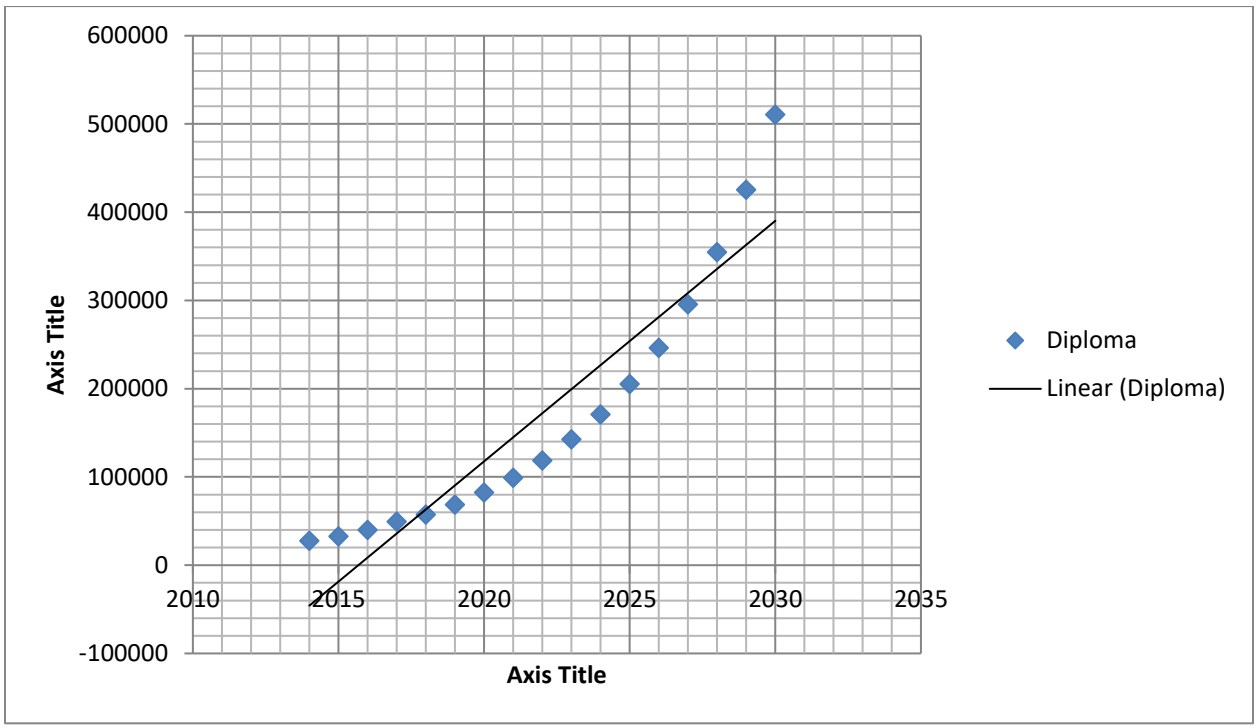


Figure 6: Extrapolated Enrollment Trends for Diploma course

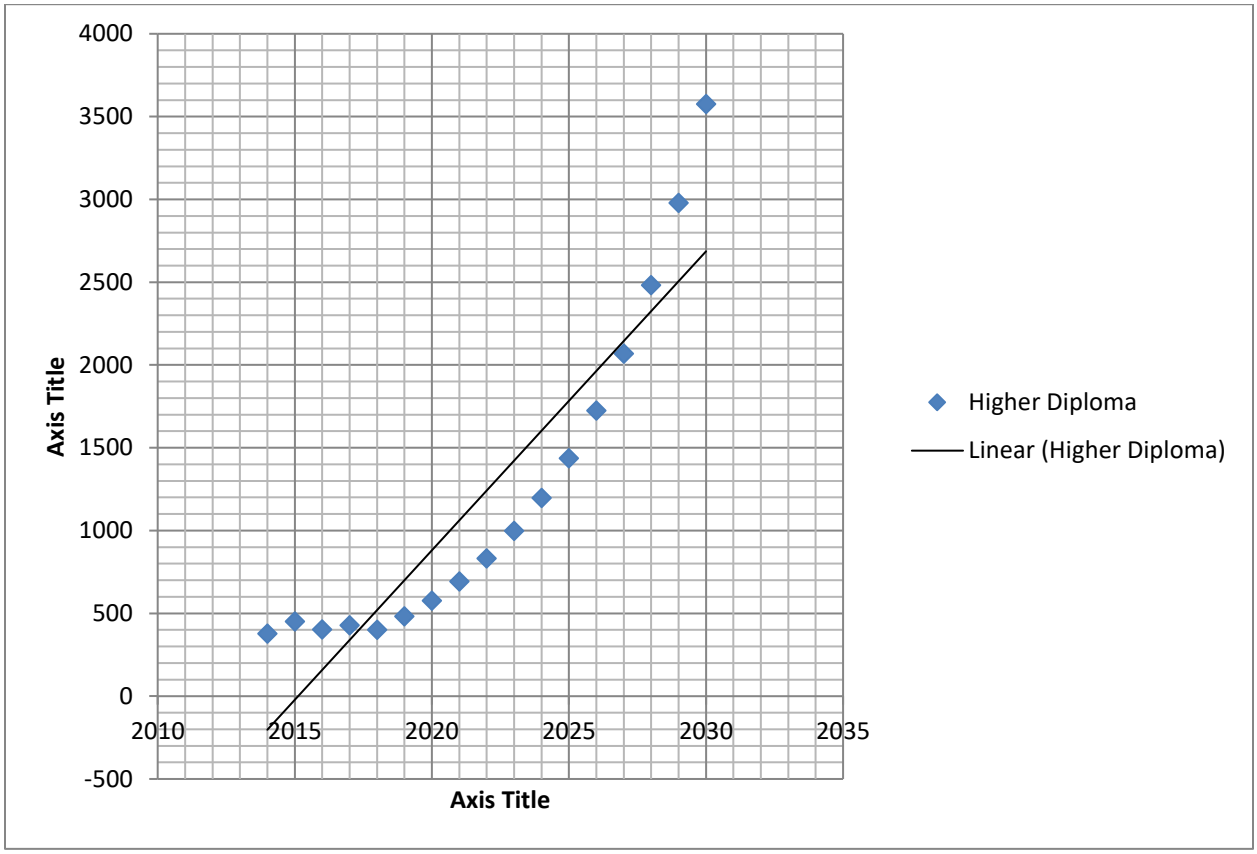
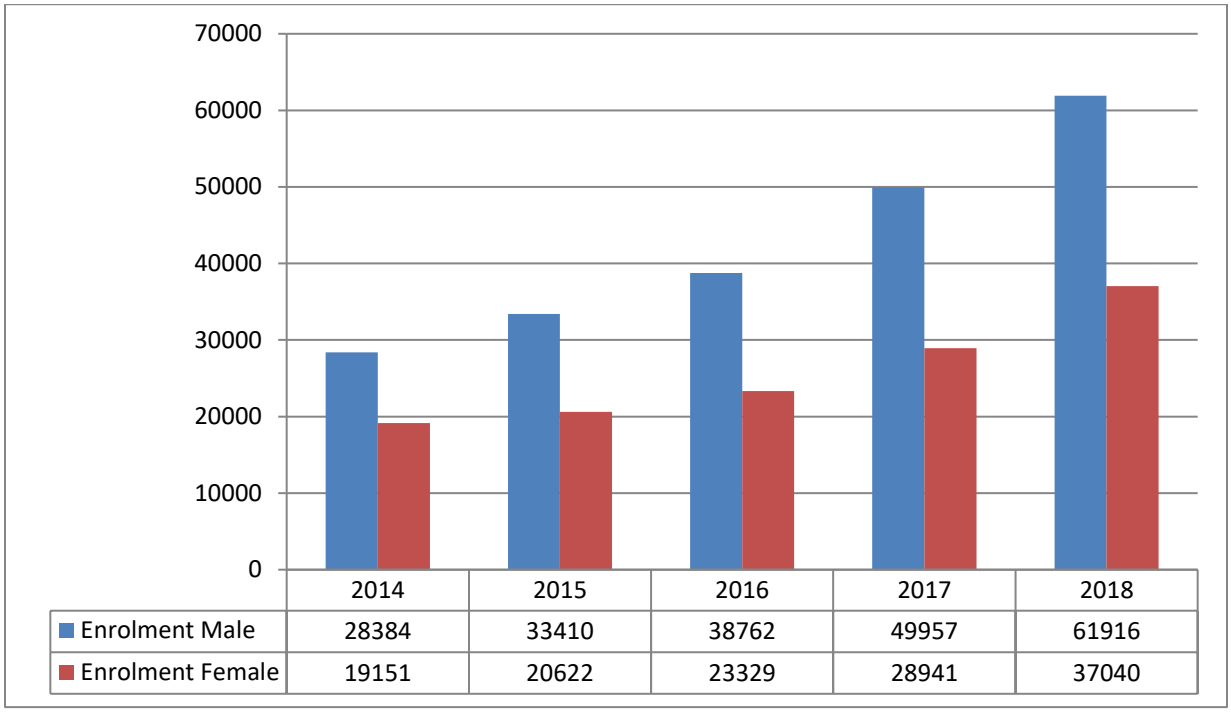


Figure 7: Extrapolated Enrollment Trends for craft certificate course

From figures 4, 5, 6, and 7 it is observable that by the year 2030 the enrollment for the Artisan, Craft certificate, Diploma and Higher Diploma will be at 91363, 276648, 510714 and 3575. This is of concern as it is expected that for industrialization the skill provision should be in the ratio of 1:3:4:5 for Engineer: Engineering technologist: Technician: Artisan respectively. This presupposes a pyramid structure of numbers with the most at the bottom being artisans but in this extrapolation the pyramid will be inverted. This could negatively impact on the achievement of industrialization by 2030.

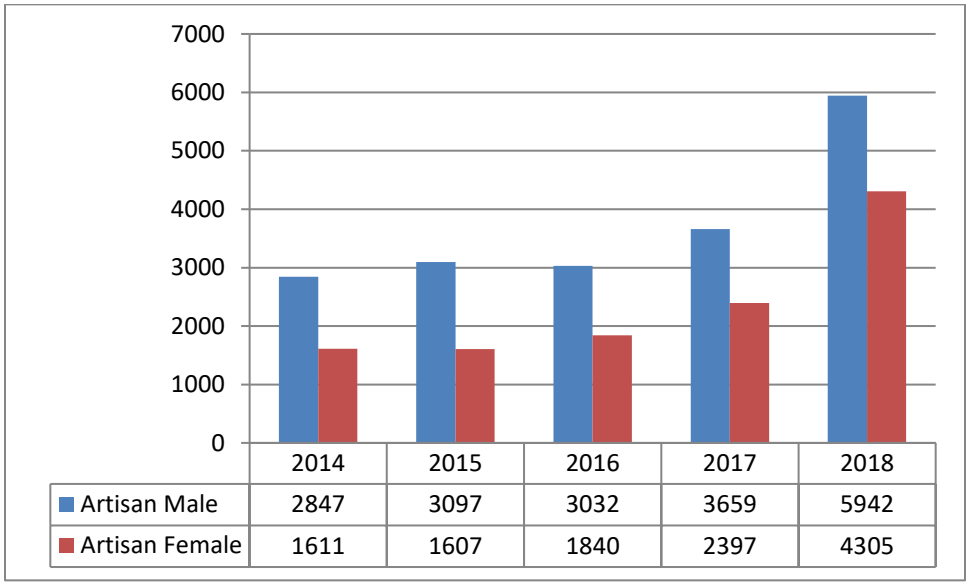
4.3 Enrollment Trends by Gender Type

The study set out to establish the enrollment trends by gender per course. The findings are presented in Figures 8, 9, 10, 11 and 12.



	2014	2015	2016	2017	2018
Enrolment Male	28384	33410	38762	49957	61916
Enrolment Female	19151	20622	23329	28941	37040

Figure 8: Overall Enrollment by Gender



	2014	2015	2016	2017	2018
Artisan Male	2847	3097	3032	3659	5942
Artisan Female	1611	1607	1840	2397	4305

Figure 9: Artisan Course Enrollment by Gender

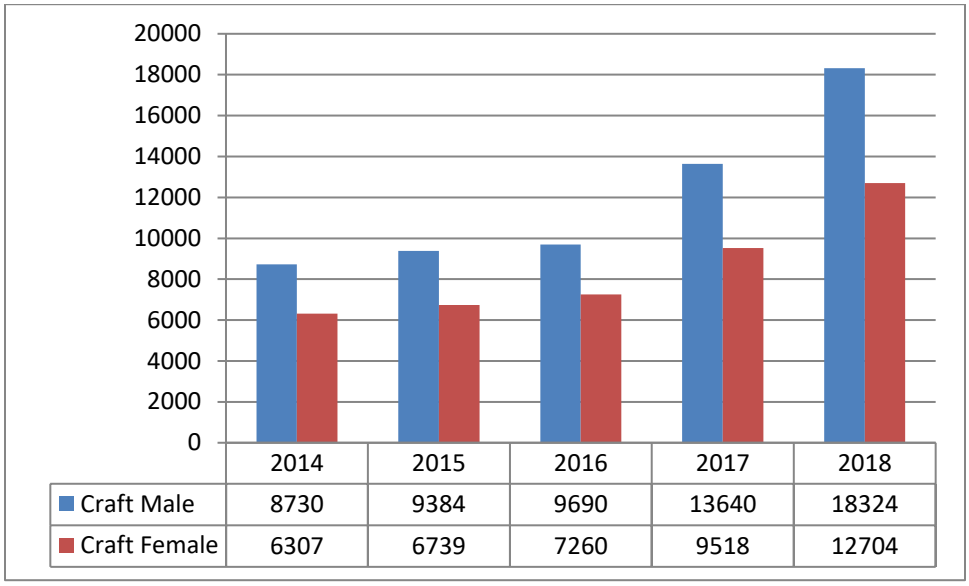


Figure 10: Craft Course Enrollment by Gender

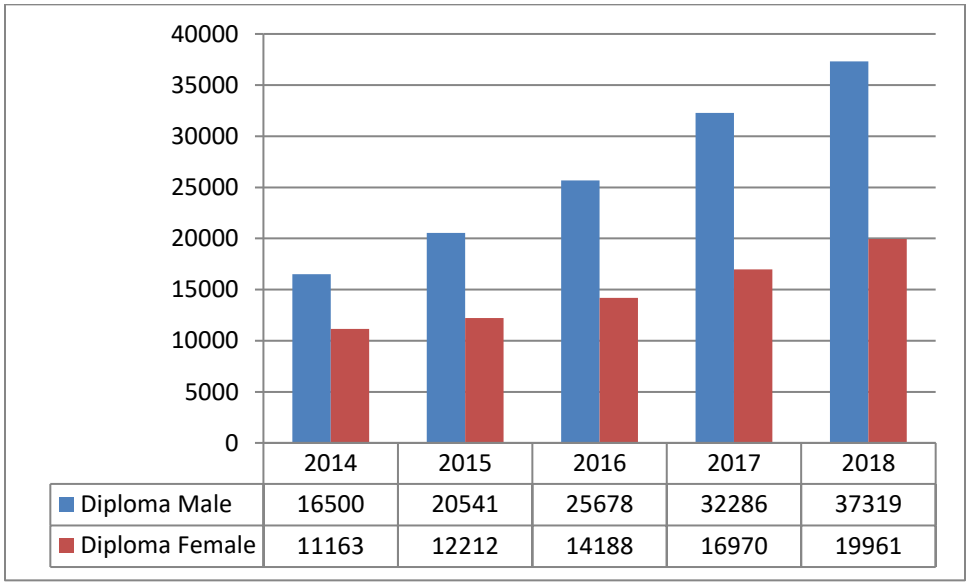
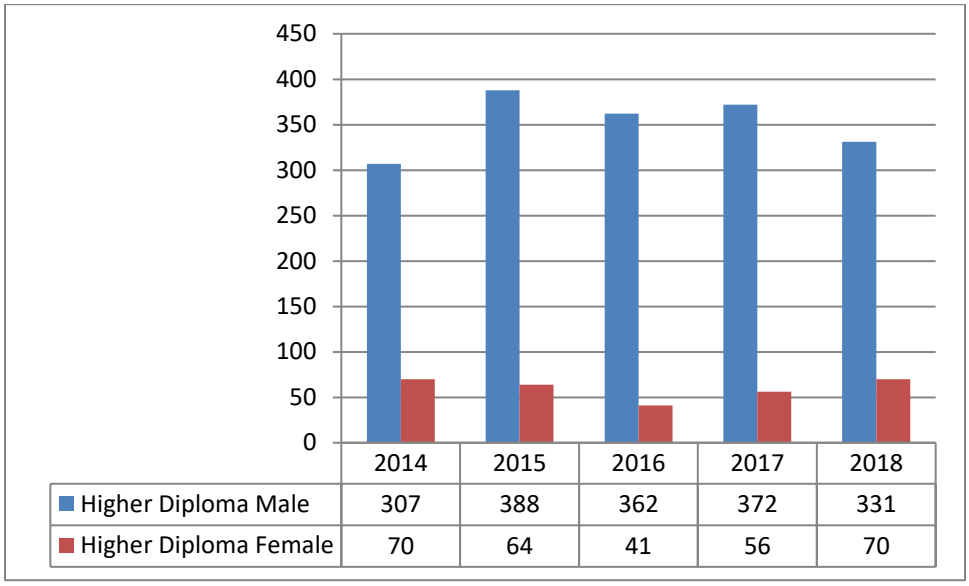


Figure 11: Diploma Course Enrollment by Gender

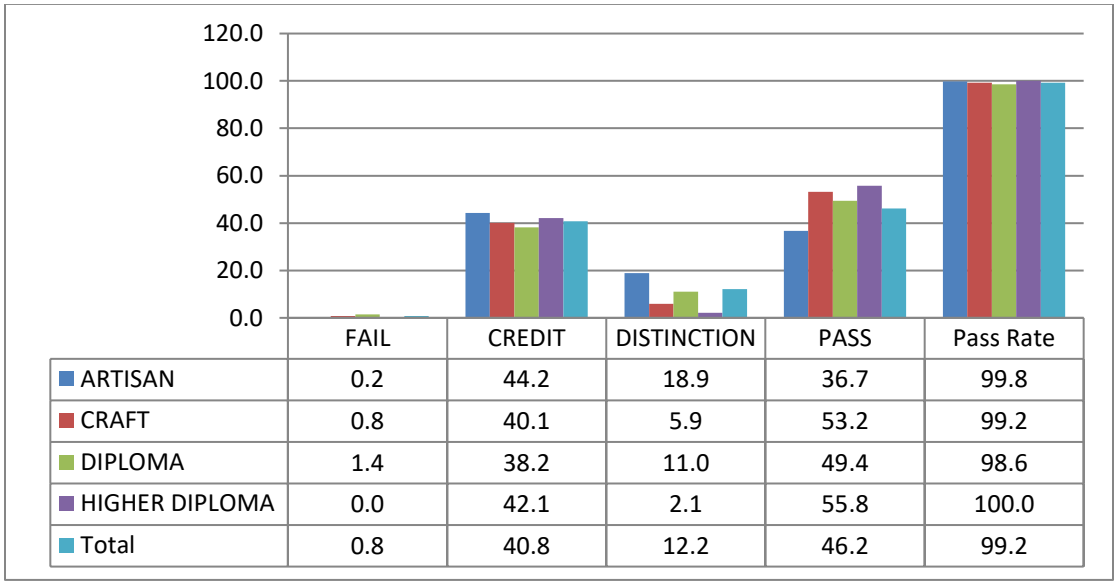


	2014	2015	2016	2017	2018
Higher Diploma Male	307	388	362	372	331
Higher Diploma Female	70	64	41	56	70

Figure 12: Higher Course Enrollment by Gender

From Figures 8, 9, 10, 11, and 12 it is observable that there exist gender disparities in the enrollment across courses. The highest disparities are observed at the higher diploma stage. This points to lack of equity in access to Technical education for the female student.

Pass rates



	FAIL	CREDIT	DISTINCTION	PASS	Pass Rate
ARTISAN	0.2	44.2	18.9	36.7	99.8
CRAFT	0.8	40.1	5.9	53.2	99.2
DIPLOMA	1.4	38.2	11.0	49.4	98.6
HIGHER DIPLOMA	0.0	42.1	2.1	55.8	100.0
Total	0.8	40.8	12.2	46.2	99.2

Figure 13: Pass rates per course

From Figure 13 it is observable that majority of Technical examination candidates 99.2% enrolled for KNEC examinations over the period 2014 – 2018 passed their examinations. There is comparability of pass rates across all the course types as all of them registered a pass rate of over 98%. It is however significant to note that despite this high pass rates in technical examinations available literature indicates that they employers still need to train them on the job

before they can efficiently work(Tarno, Simiyu, Kitainge & Rono, 2017). This could be a confirmation that there is a disconnect between content covered in technical courses and the job market expectations.

4.9.2 Observation and discussion

For TVET to feed into reduction of unemployment and industrial development there has got to be demand driven TVET training. The enrollment in TVET has got to talk to the demand for specific skills in the market. The recommended ratio of 1;3:4:5 of Engineer: Engineering technologist: Technician: Artisan for industrialization to occur has got to be adhered to for Kenya to begin experiencing returns from reforms in TVET policy. The enrollment data analyzed in this study reveals that majority of candidates register for Diploma course followed by certificate and the lowest enrollment is observed at the artisan level. This results in an inverted pyramid of the numbers of technical expertise requisite of industrialization. This could point to lack of market surveys 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.

There are gender disparities in the enrollment in TVET with the greatest disparities in the engineering courses where a higher percentage of male that female enroll for the courses. Further, there are courses where only male or female candidates enrolled over the period of five years.

There is a disconnect between content covered in technical courses and the job market expectations. This is evidenced by the high pass rates revealed in this study yet literature points to the need for further training by employers when the technical course graduates are employed.

5.0 Conclusion and Recommendations

5.1 Conclusion

- TVET provision policy/ decision making in Kenya requires a constant supply and use of assessment and enrollment data for effective policy decisions on access equity and demand for particular skills if it is to enable industrialization and job creation

There is soon going to be an excess of certain skills in the market without enough opportunities for self employment as a result of the inverted pyramid in qualifications. This is evidenced by the extrapolated data that reveals that by the year 2030 when Kenya hopes to be industrialized there will be 3575 engineers, 510714 engineering technologists: 276648 technicians and 91363 artisans.

The imbalanced distribution of enrollment could indicate that market surveys have not been effectively used to inform TVET training policy and decision making.

High pass rates in Technical courses when considered against other research findings that reveal low skill levels of the technical course graduates may be a pointer to the need for review the training model used in Kenya to better align training with industry needs.

5.2 Recommendations

The MoE should carry out regular job market surveys to inform TVET policy formulation. Further TVET policy should seek to improve TVET provision by borrowing from strengths and weaknesses of TVET models which exist in other countries and which may be of interest in a new policy in Kenya. To this end the German Dual Model for TVET training could be a one from which Kenya may identify and borrow best practices.

County governments should sensitize their population on the county development agenda and collaborate with TVET institutions to ensure training for skills related to the industries in their counties especially in this era of devolution where many counties are putting up industrial parks.

The TVET institutions need to sensitize students on the importance of certain courses to ensure gender balance.

Employers should use the National Qualifications Framework to guide remuneration for persons with similar qualifications. This is with a view to moderate variations across employers; a factor that could be pushing students to keep pursuing higher qualifications and hence leaving no one to carry out the artisan jobs and offsetting the recommended ratio of 1:3:4:5.

TVET institutions should ensure that their enrolment of students for courses is based market surveys and there should be constant consultation with the industries during decision making.

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