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# **Master's Thesis of International Studies**

(International Area Studies)

## **Embracing Technical and Vocational Education and Training for Economic Development: A Critical Analysis of the Success of Korea Polytechnic Colleges with Policy Recommendations for Youth Polytechnics in Kakamega County, Kenya**

**August, 2021**

Development Cooperation Policy Program  
Graduate School of International Studies  
Seoul National University

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# **Embracing Technical and Vocational Education and Training for Economic Development:**

**A Critical Analysis of the Success of Korea Polytechnic  
Colleges with Policy Recommendations for Youth Polytechnics  
in Kakamega County, Kenya**

A thesis presented

by

**ZABLON OKENGE ESHIRUMBA**

A dissertation submitted in partial fulfillment of the requirement  
for the Degree of  
Master of International Studies

**Graduate School of International Studies  
Seoul National University  
Seoul, Korea**

**Embracing Technical and Vocational Education  
and Training for Economic Development:**  
A Critical Analysis of the Success of Korea Polytechnic (KOPO)  
Colleges with Policy Recommendations for Youth Polytechnics  
in Kakamega County, Kenya

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# **ABSTRACT**

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Investment in human capital which is done through a country's education and training system is key to achieving sustainable and inclusive development as it directly increases worker productivity, innovation and access to economic opportunities besides improving a country's competitiveness. Formal academic institutions invest in long term skills while TVET institutions develop skills and knowledge for the world of work hence the TVET system is an important component of the labor market. Youth Polytechnics were established in Kenya as part of TVET institutions to train skilled workers targeting the uneducated youth, school drop-outs and the unemployed. The Polytechnics were expected to play a crucial role in developing the skills required by the immediate labor market but an analysis of their performance reveals a great dissatisfaction of the training provided resulting to a challenge of low youth labor force participation rate and high youth unemployment rates as data by ILO (2019) indicates (40% and 18.34% respectively) compared to the overall national statistics (70% and 9.31% respectively). The inability of the training system to play its role

is alluded to a number of challenges including lack of prioritization, weak academia-industry cooperation, inadequate financing, sub-standard training facilities and equipment, negative perception by society and poorly motivated instructors. In an effort to reposition TVET training as a new driver of economic growth, the government initiated several reforms including increasing budgetary allocation, paying tuition fees for trainees and undertaking several publicity campaigns aimed at correcting the negative public perception. In contrast to Kenya, the TVET system in Korea is hailed as a key factor contributing to the country's rapid economic success as it played a crucial role in developing the skills required by the industrial sector. For the period 1987 and 1997, Korea achieved near full employment, recording average annual unemployment rate of 2.4%. It was against this background, that the study sought to investigate the factors that made the vocational training in Korea effective. The study used the Framework for evaluating TVET developed by the Pacific Community and the World Bank Workforce Development (WfD) Diagnostic Tool to investigate the vocational training in Korea focusing on Korea Polytechnic (KOPO) Colleges established to develop industrial workers. The analysis used data from KOPO College website, websites of relevant government ministries and agencies and publications by different research organizations like GKED, KRIVET and HRD Services of Korea. The findings indicate that the vocational training was able to create a large pool of productive, innovative and skilled workers who provided Korea with the cutting-edge competitive advantage necessary for industrial development. Among the success factors of KOPO

Colleges is the ability to link training priorities to national economic development priorities; establishing a legal framework to support training; investment in R & D; high use of reliable data on developing training plan; a close industry–academia cooperation; adherence to quality and standards; provision of high-quality training infrastructure like equipped libraries, ICT equipment, learning and practice halls, and instructional materials; adequate financing; ensuring that the poor, youth and marginalized groups access training; and an effective monitoring, evaluation and feedback mechanism. The recommendations of the study will be useful to the County government of Kakamega as she aspires to reform the Youth Polytechnics to become effective in producing the skills required by the labor market and help Kenya achieve the aspirations of Vision 2030 and Sustainable Development Goal 4.

**Key Words:** TVET, Economic development, Skills, KOPO Colleges, Youth Polytechnics

***Student Number: 2019-20283***



## **TABLE OF CONTENTS**

<b>ABSTRACT .....</b>	<b>i</b>
<b>TABLE OF CONTENTS.....</b>	<b>iv</b>
<b>LIST OF TABLES .....</b>	<b>viii</b>
<b>LIST OF FIGURES .....</b>	<b>ix</b>
<b>LIST OF ACRONYMS .....</b>	<b>xi</b>
<b>DEFINITION OF TERMS.....</b>	<b>xiii</b>
<b>CHAPTER I: INTRODUCTION .....</b>	<b>1</b>
1. Background.....	1
2. The Economic Background of Kenya and South Korea.....	5
3. Motivation of the Study.....	8
3-1 Educational Attainment in Kakamega County.....	8
3-2 Youth Unemployment and Labor Force Participation in Kenya.....	10
4. Problem Statement.....	11
5. Objectives of the Study .....	14
6. Research Questions .....	14
7. Hypothesis .....	15
8. Significance of the Research .....	15
9. Scope of the study .....	15
10. Organization of the Thesis.....	15
<b>CHAPTER II: RESEARCH METHODOLOGY AND LITERATURE REVIEW ....</b>	<b>17</b>

1. Introduction .....	17
2. The Study Conceptual Framework .....	17
2-1 The Conceptual Framework .....	17
2-2 Definition of Variables in the Framework.....	20
3. Theoretical Framework and Empirical Literature Review .....	29
3-1 Theoretical Framework .....	29
3-2 Empirical Literature Review .....	35
4. Research Methodology .....	36
5. TVET in the Era of the 4 <sup>th</sup> Industrial Revolution .....	37
6. Conclusion.....	41
<b>CHAPTER III: TVET AND KOPO COLLEGES IN KOREA.....</b>	<b>42</b>
1. Introduction .....	42
2. Overview of the Education System in Korea .....	42
2-1 The Basic Education System.....	42
2-2 TVET in Korea Education System.....	43
3. The Development of TVET in Korea .....	45
4. Korea Polytechnic (KOPO) Colleges .....	48
4-1 The Development of Korea Polytechnic (KOPO) Colleges.....	48
4-2 The Success of KOPO Colleges.....	50
5. Conclusion.....	51

<b>CHAPTER IV: DISCUSSION ON THE SUCCESS FACTORS OF KOPO COLLEGES.....</b>	<b>52</b>
1. Introduction .....	52
2. Data Collection.....	52
3. The Role of Vocational Training in Korea Economic Development .....	53
4. Understanding the Success Factors of KOPO Colleges .....	54
4-1 The Input Elements in the TVET System.....	55
4-2 The Process Elements in the TVET System.....	67
5. Testing of Hypothesis and Conclusion.....	78
<b>CHAPTER V: CONCLUSION AND POLICY RECOMMENDATIONS .....</b>	<b>80</b>
1. Introduction .....	80
2. Implications for TVET in Kenya and Youth Polytechnics in Kakamega County.....	80
2-1 The Basic Education System in Kenya .....	80
2-2 The Vocational Training System in Kenya .....	83
2-3 TVET Institutions in Kenya .....	86
2-4 The Case of Youth Polytechnics in Kakamega County .....	87
2-4-1 The Birth of Regional Governments in Kenya .....	87
2-4-2 From Village Polytechnics to Youth Polytechnics .....	89
2-4-3 Youth Polytechnics in Kakamega County .....	90
2-4-4 Analyzing the Youth Polytechnics Using the Conceptual Framework.....	93
3. A Comparative Analysis of KOPO Colleges and Youth Polytechnics .....	101

4. Summary of findings .....	102
5. Recommendations for Enhancing Performance of the Youth Polytechnics.....	104
6. Suggested areas for further research.....	111
<b>REFERENCES.....</b>	<b>113</b>
1. Primary References .....	113
2. Secondary References .....	114
<b>APPENDIX.....</b>	<b>128</b>
1. List of Korea Polytechnic Colleges.....	128
2. List of Youth Polytechnics and Staff Establishment in Kakamega County .....	130
<b>ABSTRACT IN KOREAN.....</b>	<b>133</b>
<b>ACKNOWLEDGEMENT.....</b>	<b>136</b>

## LIST OF TABLES

<b>Table 1:</b> Type of TVET institutions in Korea .....	47
<b>Table 2:</b> Laws Enacted to Support Vocational Training .....	56
<b>Table 3:</b> Stages of Development of Education and Training in Korea.....	58
<b>Table 4:</b> Estimated Skills Demand During 1 <sup>st</sup> 5-Year Economic Development Plan .....	66
<b>Table 5:</b> KOPO Colleges 2016 Education Training Enrolment .....	76
<b>Table 6:</b> A Comparative Analysis of KOPO Colleges and Youth Polytechnics .....	101
<b>Table 7:</b> List of KOPO College Campuses .....	128
<b>Table 8:</b> List of Youth Polytechnics and Staff Establishment.....	130

## LIST OF FIGURES

<b>Figure 1:</b> Comparison of the Production Structure of Kenya and Korean Economies .....	7
<b>Figure 2:</b> Educational Attainment for Age 3 Years and Above in Kakamega County .....	9
<b>Figure 3:</b> Comparison of Unemployment and Labor Force Participation Rates .....	11
<b>Figure 4:</b> Conceptual Framework for the Study .....	20
<b>Figure 5:</b> Workforce Structure Model for Developing and Industrialized Economies .....	28
<b>Figure 6:</b> IR 4.0 Core Work Related Skills .....	40
<b>Figure 7:</b> Korea Education System .....	43
<b>Figure 8:</b> TVET in Korea Education System .....	45
<b>Figure 9:</b> Korea Employment Distribution of Graduates by Type of Institution, 2015 ....	51
<b>Figure 10:</b> Growth of Skilled Workers in Korea for the Period 1965 - 2010 .....	54
<b>Figure 11:</b> An illustration of Korea Polytechnic Education Certificate (KPEC) Flow .....	62
<b>Figure 12:</b> Organization Structure of KOPO Corporation .....	71
<b>Figure 13:</b> Organization Structure of KOPO Campus .....	73
<b>Figure 14:</b> An illustration of the KOPO Dedicated Corporate Operation System .....	75
<b>Figure 15:</b> The Basic Education System in Kenya .....	83
<b>Figure 16:</b> TVET in the Kenyan education system .....	85
<b>Figure 17:</b> TVET Institutions in Kenya (2010 – 2018) .....	87
<b>Figure 18:</b> The Governance Structure of the Republic of Kenya .....	89

<b>Figure 19:</b> Map of Kenya Showing Location of Kakamega County .....	92
<b>Figure 20:</b> Analysis of Budgetary Allocation to Youth Polytechnics .....	96
<b>Figure 21:</b> Organization Structure of Youth Polytechnics in Kakamega County .....	98

## LIST OF ACRONYMS

ADB	Asian Development Bank
ATVET	Agricultural Technical and Vocational Education and Training
CBC	Competency Based Curriculum
GKED	Global Knowledge Exchange & Development Center
HRD	Human Resource Development
ILO	International Labor Organization
I.R	Industrial Revolution
ISCED	International Standard Classification of Education
KCCI	Korea Chamber of Commerce and Industry
KCPE	Kenya Certificate of Primary Education
KCSE	Kenya Certificate of Secondary Education
KDI	Korea Development Institute
KICD	Kenya Institute of Curriculum Development
KIHBS	Kenya Integrated Household Budget Survey
KNBS	Kenya National Bureau of Statistics
KNEC	Kenya National Educations Council
KOPO	Korea Polytechnic
KRIVET	Korea Research Institute for Vocational Education and Training
NIVTCs	National Industrial Vocational Training Centers
SDGs	Sustainable Development Goals
STEM	Science Technology Engineering and Mathematics
TVET	Technical and Vocational Education and Training
UNESCO	United Nations Educational, Scientific and Cultural Organization



UNEVOC	International Centre for Technical and Vocational Education and Training
WDI	World Development Indicators
WfD	Workforce Development

## DEFINITION OF TERMS

**Affective skills** – Skills that demonstrate one’s attitude towards timeliness, accuracy, effectiveness and understanding self and others;

**Blue Collar Work** – Work that is practical in nature and requires people to “work more with their hands than their head”;

**Cognitive skills** – Skills that demonstrate understanding of subject matter of academic subjects like language, mathematics, social sciences, and pure and applied sciences;

**Demand-Driven Training** – Training that prioritizes individual trainee’s needs, employers needs and labor markets situation;

**Hard skills** – Skills relating to performing a specific task or situation;

**Jua Kali** – Kenya informal industrial sector that comprises small scale traders and artisans;

**Lifelong Learning** – All types of systematic educational activities supplementing education, learning for adults and education for enhancement of vocational abilities other than regular school education;

**Polytechnic** – A vocational college that offers a comprehensive range of technical instruction in industrial arts and applied sciences.

**Psychomotor skills** – Skills that demonstrate understanding of tasks performed in an occupation, a job or a business along with the practical ability to apply the skills;

**Skill** – Ability acquired through deliberate, systematic and sustained efforts to carry out a task with pre-determined results;

**Soft skills** – A combination of character traits and attitudes that enable people to effectively navigate their environment, work well with others and achieve their goals, shaping interpersonal and social character and include communication skills, teamwork, time management, initiative, supervision, problem solving, ability to work under pressure, positive work ethics, motivation and commitment, networking and professionalism.

**Vocational Education** – Education that imparts long-term basic skills and is implemented in secondary formal education institutions;

**Vocational Training** – Training that imparts professional skills and knowledge for the world of work;

**White Collar Work** – Professions, semi-professions and work in offices;

**Youth** - ILO defines youth as people aged 15 to 24 years; African Union defines youth or young people as persons between the ages of 15 and 35 years; Kenya constitution defines youth as people within the ages 15 to 35 years.

# **CHAPTER I: INTRODUCTION**

## **1. Background**

Skilled workers are important in facilitating the process of economic development as they improve productivity and innovation that drives industrial activities. The responsibility of imparting citizens with relevant occupational and technical skills the labor market requires is performed by the Technical and Vocational Education and Training (TVET) system of a country, (World Bank, 1991). TVET has existed in all regions of the world for a long time but was described by various terms, the common ones being Career and Technical Education and Workforce Education, Occupational Education, Vocational Education, Technical-Vocational Education, Technical Education, Vocational Education and Training, Professional and Vocational Education, Apprenticeship Training, among others.

Participants of the Second Congress on Technical and Vocational Education (TVE) held in Seoul, South Korea in 1999 recommended to UNESCO the term ‘Technical and Vocational Education and Training (TVET)’ to be used in relation to related concepts in vocational education and training. After UNESCO adopted these recommendations, the term Technical and Vocational Education and Training (TVET) has been used globally, (UNESCO, 1999). TVET involves, in addition to general education, the acquisition of practical skills, attitudes and knowledge in various occupational fields, (UNESCO-UNEVOC, 2009). TVET

concerns with imparting skills and knowledge for work that is practical in nature, requiring people to work “more with their hands than their head”. TVET prepares individuals towards blue collar’ work, which involves “technical skills in the various crafts and trades, and technicians and technologists, in productive enterprises”, as opposed to ‘white collar work’ which is the “professions, semi-professions and work in offices”.

TVET main role is to provide knowledge and skills that are necessary to enable people to work as well as expand their skills set, raise productivity and improve societal welfare. Training is dispensed either through formal and informal public and private vocational education and training institutions and is aimed at enhancing societal access to life-long learning. Vocational education imparts long-term basic skills and is implemented in secondary formal education institutions while vocational training imparts short-term professional skills and knowledge for the world of work. Though vocational education has been in existence for long, vocational training gained prominence because the formalized education wasn’t able to adequately produce the skills required by the labor market, (Moses Oketch, 2007; Young-Sun Ra & Soon-Hee Kang, 2012).

TVET produces a skilled workforce that has multiple benefits to an economy. First, skilled workers are more productive and improves the productivity of those around them, (Booth and Snower, 1996, Dieter Euler, 2013). Second, skilled workers are a significant determinant of amount of physical capital that can be invested in an economy given that skills and capital

are complementary, (ILO, 2004). A larger proportion of skilled labor force enables machinery to be used more efficiently and raises return on investments and firms' profitability, (Ashton et al. 1999; Caillods, 1994). Lastly, TVET leads to positive social integration i.e the upward movement of disadvantaged groups of a society into its mainstream resulting from improved wages, (European Union, 2011; World Bank, 2012). Many participants in TVET institutions are from disadvantaged groups who face labor-market exclusion hence TVET is the best means by which they can become better or worse. World Bank noted that "Most of the poor in developing countries are found in rural areas and in the urban informal sector, and their principal asset is their labor and improving their productivity and earnings is their main road out of poverty" (World Bank, 1991)<sup>1</sup>.

Scholars have termed the TVET system in Korea as a key factor contributing to the country's rapid development, with GDP Per capita growing from US \$ 105 in 1965 to US \$ 27,222 in 2015, (Republic of Korea, 2017, KEDI, 2015). Investing in education and training has also made Korea workforce very productive as evidenced by the labor productivity data by ILO. According to this statistic, the labor productivity, which is a measure of the "total volume of output measured in terms of GDP produced per unit of labor", for Korea was \$71,122 in 2019 compared to that of Kenya which was \$7,188, (ILOSTAT, 2020). It should be noted

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<sup>1</sup> World Bank Policy Paper on Vocational Education and Training, (1991).

that labor productivity is a useful economic indicator that can explain the industrial competitiveness, economic growth and the living standards of citizens in an economy.

TVET Programs in Korea were planned and implemented alongside the country's five-year economic development plans. Skilled workers were trained formally through the school education system including the vocational high schools and informally through technical schools, industries and vocational training facilities. Both formal education system and vocational training systems were implemented alongside each other so as to provide the required workforce. TVET made remarkable achievements as evidenced from the period 1987 to 1997 when Korea realized near full employment as the labor market recorded annual unemployment rates of 2.4% and also ensured availability of competent workers required by the labor market, (Young-Sun Ra; & Soon-Hee Kang, 2012). Korea Education Development Institute (KEDI, 2015) noted that Korea rolled-out Compulsory Primary Education Policy in 1954 and by the year 1959, the country had achieved compulsory primary education which provided a pool of workforce equipped with literacy and life skills who were the foundation of economic development. With the launch of the first Economic Development Plan, and from the period 1962 to 1980, vocational education was expanded focusing on promoting labor-intensive light industries in the period 1967–1971, then shifting to heavy and chemical industries from the period 1972–1981.

Chae, ChangKyun and Jaeho Chung (2009) notes that Korea polytechnic colleges (KOPOs) are part of the TVET system established to develop industrial workers i.e craftsmen and technicians in a training program that takes one and two years respectively. Craftsmen training targets youth not joining formal colleges, people unemployed and citizens who are not educated and there are no academic qualifications required to enroll. The technician program targets high school graduates and upon completion, trainees receive a Bachelor of Industry, equivalent to bachelor's degree. Courses taught include construction, metal, ICT, industrial application, machinery, electronics, design and textiles. Whereas the vocational training system in Korea can be lauded for the remarkable success, the same cannot be said of the Youth Polytechnics in Kenya which were expected to train skilled workers. An analysis of their performance reveals that employers are greatly dissatisfied with the trainees who mostly do not possess the skills required by the labor market which has resulted to low youth labor force participation rate and high youth unemployment rates.

## **2. The Economic Background of Kenya and South Korea**

Upon gaining independence from Japanese occupation in 1945, Korea was an underdeveloped subsistence agricultural economy, but today, the country has undergone great transformation to become an industrial power house. In a bid to industrialize, the government identified and nurtured six major industries in steel, non-ferrous metals, automobiles, ships, electronics and chemicals. Private sector investment was encouraged in



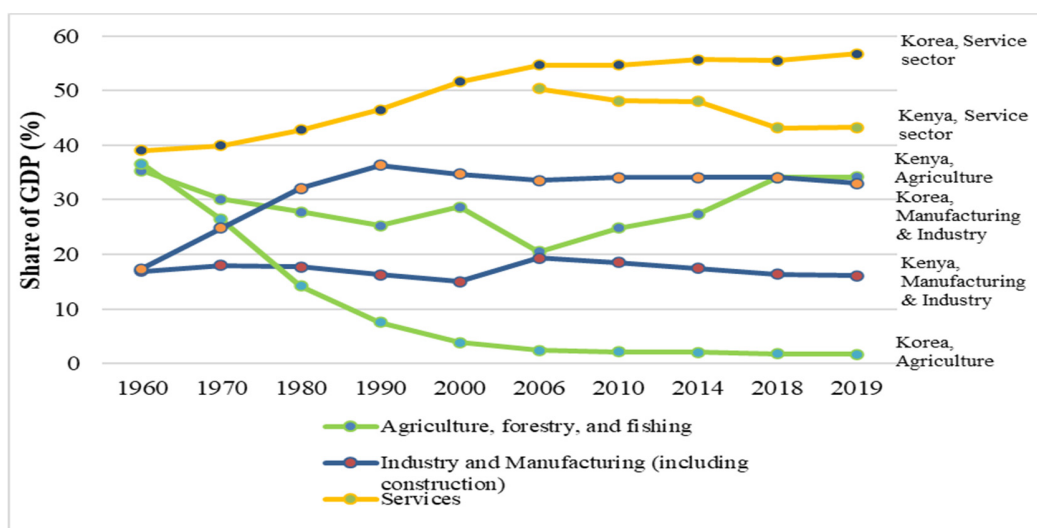
these industries through providing export-oriented companies with financial and tax incentives and human resource training to develop the required workforce, (Republic of Korea, 2019).

The economy structural transformation can be elaborated by examining the shift in export commodities. In 1960s, the major export items were primary resource-based i.e iron ore, coal, rice, tungsten, fish and timber but in the 1990s and 2000s, the major exports changed to industrial goods like ships, refined oils and high-technology electronics like semi-conductors, electronic display panels, mobile phones and automobiles, (Won-Gyu Hwang, 2013). Won-Gyu Hwang further noted that in 1953, the primary sector accounted for 48.4% of GDP, the manufacturing sector only 9.0% while service sector 42.6% but in 2009, the primary sector accounted for a paltry 3% of GDP, manufacturing sector was 27.8% while the service sector had increased to 69.2%.

Whereas the production structure of the Korean economy has transformed from primary to one dominated by manufacturing and service sector, making Korea an industrialized economy where GDP per capita exceeds USD 30,000, the story of Kenya is one of stagnation. Kenya is classified as a lower middle-income country where GDP per capita is approximately USD 1,800, (WDI, 2020). In 1960, agriculture accounted for over 35% of GDP while industry and manufacturing accounted for only 16%. Fast forward to 2019 and the role of agriculture hasn't changed, still accounts for over 34% of GDP, industry and

manufacturing sector still accounts for 16% mainly composed of low-value industries like food processing, textile, small-scale consumer goods, cigarettes, oil refinery and cement while service sector, mainly constituting of wholesale and retail trade, financial services, transport, government, professional and personal services, e-commerce and other e-based services accounts for 43%. The shift in the production structure of both countries is elaborated, (see figure 1).

**Figure 1:** Comparison of the Production Structure of Kenya and Korean Economies



**Source:** Researcher Analysis from World Bank Data (<https://data.worldbank.org/indicator/>)

Kakamega County is one of the 47 Counties in Kenya that were created by the new constitution, (Republic of Kenya, 2010). Located in the western part of Kenya, Kakamega covers an area of 3,051.3 Km<sup>2</sup> with a population of 1,867,579 people which represents 3.9%

of national population, (Republic of Kenya, 2019b). The County economy is predominantly agricultural accounting for 2.4% of national GDP. Whereas at national level, agriculture accounts for 32.6% of GDP, in Kakamega county 54% of GDP comes from agriculture, with 61.1% of the population practicing some form of agriculture compared to 40% at national level, (Republic of Kenya, 2019d).

### **3. Motivation of the Study**

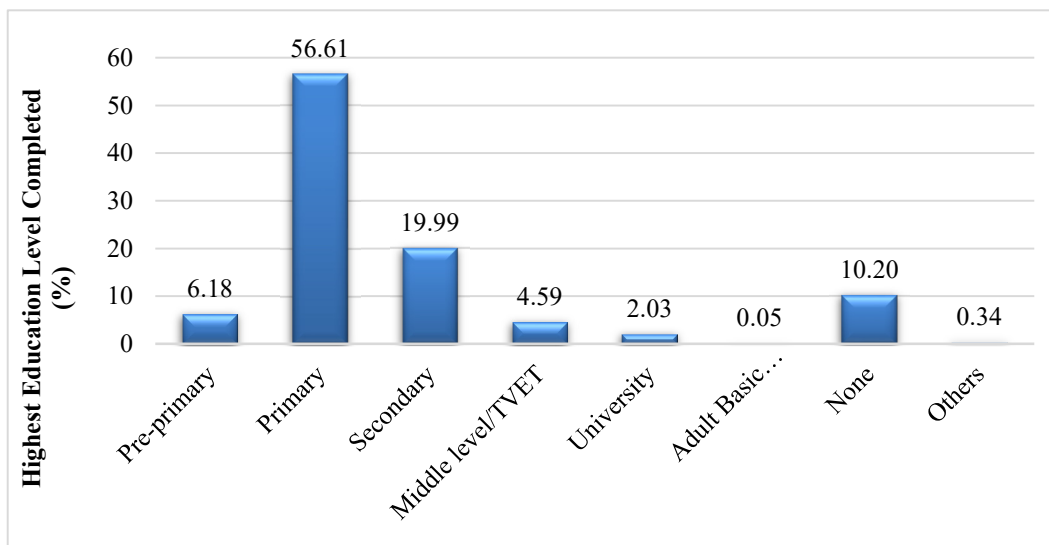
The motivation for this study was the highly successful TVET model of Korea and the high youth unemployment levels in Kenya. Korea Polytechnics admits trainees from poor backgrounds, giving priority to women, youth and unemployed to train them as Craftsmen and Technicians, (Chae, ChangKyun and Jaeho Chung, 2009). The academia-industry partnership practiced by KOPO colleges that has seen over 80 % of graduates get employed in the first year of leaving the institution is another great motivation to study the Korea Polytechnic Colleges. The challenge of high youth unemployment levels in Kenya is discussed below.

#### **3-1 Educational Attainment in Kakamega County**

As observed by the various reports produced by the Government of Kenya, educational attainment is a good indicator of the labor market performance, competitiveness and productivity, (Republic of Kenya, 2018d). Analysis of educational attainment by residents

of Kakamega County aged 3-years and above (see figure 2), reveals that 6.18% attained pre-primary education, 56.61% attained primary education, 19.99% attained secondary education, 4.59% attained TVET or other middle level training; 2.03% had attained university education while 0.05% had undertaken Adult Basic Education, (Republic of Kenya, 2019c). From the report, two things strike out – first, 10.20% of population reported not having attained any education level and second, a large portion of the residents who attained primary education had no Secondary or Post-secondary education and or training, hence lack the skills for gainful employment. They are the population this study is dedicated to addressing their plight.

**Figure 2:** Educational Attainment for Age 3 Years and Above in Kakamega County



**Source:** KNBS 2019 Population and Housing Census Volume IV

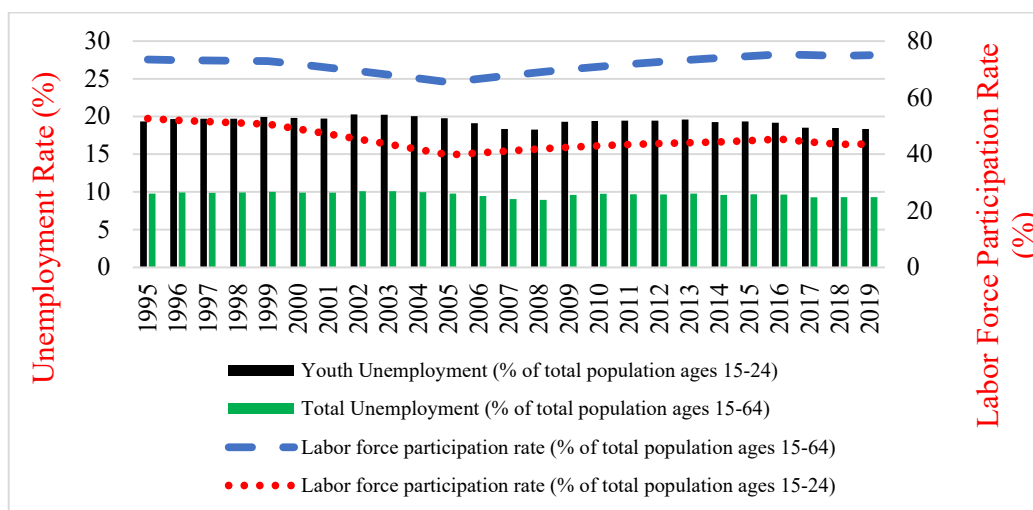
### **3-2 Youth Unemployment and Labor Force Participation in Kenya**

Youth polytechnics have existed alongside the vocational education and training in Kenya since time immemorial. These institutions were established to provide the skills required by the labor market but despite their existence, there has been little success in provision of requisite skills. Kenya continues to grapple with the challenge of high youth unemployment occasioned by ineffective vocational training and a mismatch between the skills the training institutions impart in trainees and those required by the labor market leading to skills mismatch and imbalance, (Institute of Economic Affairs – Kenya, 2010.)

The labor force participation rate, which is “the proportion of the working-age population that is actively engaged in the labor market” show that on average, about 70% of the total population are participating in the labor market in Kenya. World Bank, (2008b; 2012); ILO, (2013) observed that young people face more unemployment compared to older ones and concluded that in most countries, the unemployment rates for youth is more than overall unemployment rate. An analysis of the youth labor force participation rate shows that on average, about 40% participate in the labor market, way below the total labor force participation rate. This has resulted to high youth unemployment rates which records shows that as at 2019, stood at 18.34% compared to the overall national unemployment rate of 9.31%. This implies that a bigger proportion of the youth do not participate in the labor

market hence shrinking the size of the labor supply. The comparison of youth against total unemployment rate for the period 1995 – 2019 is presented below (see figure 3).

**Figure 3:** Comparison of Unemployment and Labor Force Participation Rates



**Source:** ILOSTAT database. (Data retrieved; 2020/06/21)

#### 4. Problem Statement

The UN Sustainable Development Goal 4 is to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.” This study supports two targets that will help Kenya achieve this goal; target 4.3 i.e “by 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university” and target 4.4: “by 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for

employment, decent jobs and entrepreneurship.” Skilled workers play an important role in a country’s development through improving productivity and innovation that facilitates industrial activities. The responsibility of imparting citizens with these skills is performed by a country’s education and training system that includes the TVET institutions.

In Kenya, Village Polytechnics, later renamed Youth Polytechnics, were established at independence as part of TVET institutions to train skilled workers targeting the uneducated youth, school drop-outs and the unemployed who formed a significant portion of the population. The Polytechnics were expected to play a crucial role in promoting inclusive socio-economic development but an analysis of their performance reveals a great dissatisfaction by employers as most of their graduates do not possess the skills required by the labor market. This has resulted to low youth labor force participation rate and high youth unemployment rates as data by ILO (2019) indicates (40% and 18.34% respectively) compared to the overall national statistics (70% and 9.31% respectively).

Contrasting Kenya’s experience, Korea’s vocational training system has been documented as a great success that was instrumental in the country’s rapid economic development as it played a crucial role in developing and supplying the skills required by the industrial sector. For the period 1987 to 1997, Korea achieved near full employment, recording average annual unemployment rates of 2.4%, a key evidence of the impact of the vocational training.

Against this background, the study sought to investigate the factors that make the vocational training in Korea effective.

The study used the Framework for evaluating TVET developed by the Pacific Community and the World Bank Workforce Development (WfD) Diagnostic Tool for Evaluating Institutional Capacity, Policies and Practices of a skills development system. Both the Framework and the Diagnostic Tool identified priority areas necessary for developing an effective workforce system as; Policy & Advocacy; Demand-driven Training; Coordination and Partnerships; Quality and Standards; Financing TVET; Access and Participation; Organization and Training Provision; and Monitoring, Evaluation and Feedback. The study analyzed how each of the priority areas is implemented by the TVET system in Korea with a focus on Korea Polytechnic (KOPO) Colleges which were established to develop industrial workers of technicians and craftsmen.

The analysis used secondary data from KOPO College website, website of various ministries; Employment and Labor; Education; and Finance and Economy; and publications by research organizations in Korea - GKED Center, KRIVET, the HRD Services of Korea among others. The study findings, as well as the recommendations will be useful to the County government of Kakamega as she aspires to reform the Youth Polytechnics and position them as the driver engines of growth as Kenya aspires to achieve middle income status as envisioned by Kenya Vision 2030 Plan and achieving the aspirations of Sustainable Development Goal 4.



## **5. Objectives of the Study**

The general objective of the study was to analyze the success of vocational training system in Korea, focusing on the success factors of Korea Polytechnic (KOPO) Colleges and making policy recommendations to Kakamega County for implementing an effective Youth training system that will respond to the County's labor market needs and spur economic development.

The specific objectives were;

- a) To understand the elements of an effective TVET system;
- b) To analyze the role played by TVET in Korea's economic development;
- c) To investigate the factors that make KOPO Colleges successful;
- d) To make policy recommendations to Kakamega County for implementing an effective youth training system.

## **6. Research Questions**

The study is guided by the following research questions;

- a) What are the elements of an effective TVET system?
- b) What role did KOPO colleges play in Korea's economic development?
- c) What are the factors that make KOPO Colleges successful?
- d) What policy recommendations can Kakamega County adopt for implementing an effective youth training system?

## **7. Hypothesis**

The hypothesis of the study is: An effective TVET system requires policies that strengthen governance, priorities that are aligned to national development objectives and modern facilities and equipment that implement training with efficient feedback mechanisms.

## **8. Significance of the Research**

The study findings will be useful to the County government of Kakamega in its efforts to revive Youth Polytechnics and develop an effective training system. The findings will also add to the existing body of knowledge especially in the ever-growing field of vocational education and training.

## **9. Scope of the study**

This research analyzed the implementation of TVET Programs in Korea with a focus on Korea Polytechnic (KOPO) colleges that develops industrial workers with emphasis on field and practical work.

## **10. Organization of the Thesis**

The thesis paper is organized in five chapters.

**Chapter one** provides an introduction by presenting the background to the research, the motivation, the problem statement, the research questions, objectives and the hypothesis of the study.

**Chapter two** presents the literature review and research methodology. It explains the conceptual framework, the theoretical framework underlying skills development, the empirical literature review, the research methodology used.

**Chapter three** presents an overview of the education system in Korea to enable understand the position of vocational training and ultimately KOPO Colleges. It starts by an analysis of the overall education system, then narrows down to vocational education and further provides a detailed analysis of the development of KOPO Colleges.

**Chapter four** presents a discussion on the success factors of KOPO Colleges as analyzed from the data collected. The discussion is presented based on the thematic areas identified in the conceptual framework.

**Chapter five** presents an overview of the education system in Kenya to enable understand the position of TVET and further gives a detailed analysis of youth polytechnics in Kakamega County. It also provides a summary of findings from the study and makes policy recommendations for establishing a successful vocational training, based on the KOPO colleges model and suggests areas of further research.

## **CHAPTER II: LITERATURE REVIEW AND RESEARCH METHODOLOGY**

### **1. Introduction**

The chapter covers the research methodology which explains the conceptual framework guiding this study and the research process; the theoretical framework underlying skills development; and finally explains the mechanisms through which a skilled workforce promotes economic development.

### **2. The Study Conceptual Framework**

#### **2-1 The Conceptual Framework**

The conceptual framework used in this study is based on two frameworks – the Pacific Community Framework for TVET developed by the Pacific Community in 2012 and the World Bank WfD Diagnostic Tool for Evaluating Institutional Capacity, Policies and Practices of a skills development system developed in 2012. The Pacific framework identifies seven key priority areas necessary for developing an effective TVET system as “Policy and advocacy; Quality and standards; Access and provision; Organization, delivery, access and pathways; Demand-driven TVET data and market research; Coordination; and Financing TVET”, (UNESCO 2015b).

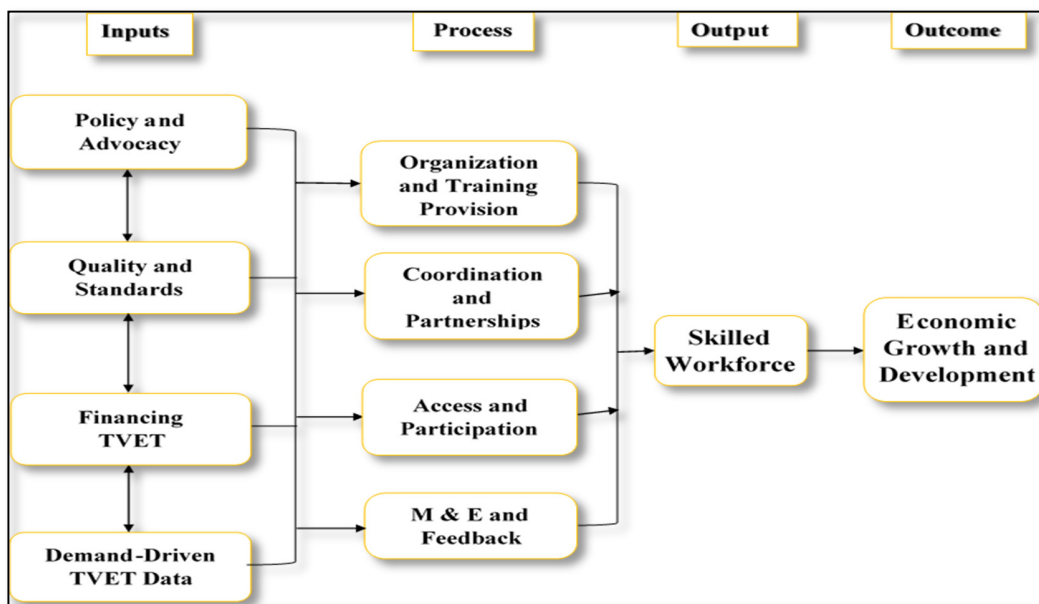
The World Bank WfD diagnostic tool identified nine key priority areas and broadly grouped them into three functional dimensions. The first functional dimension is strategic direction that assesses alignment of a skills development system to national economic development goals with priority areas as “Setting a strategic direction; Prioritizing a demand-led approach; and Strengthening critical coordination”. The second is system oversight that assesses the governance and operational functions of the skills development system with priority areas as “Relevant and reliable standards for quality; Diversifying pathways for skills acquisition; and Ensuring equity in Funding”. The third is service delivery which assesses the management of the provision of services in the skills development systems with priority areas as “Enabling diversity and excellence in training provision; Fostering relevance in public training programs; and Enhancing evidence-based accountability for results,” (World Bank, 2013). In addition, the World Bank Diagnostic Tool elaborated the likely consequences if the priority areas are well-coordinated or not coordinated.

The conceptual framework developed for this study recognizes that a strong coherence should exist between skills demanded and skills supplied to expedite the process of economic development through improved employability, productivity and industry competitiveness, (World Bank, 2013). The development of the conceptual framework (see figure 4) was guided by the theory of change promoted by Weiss Carol, (1972) and the works

of Kigwilu and Akala, (2017); Peter Doolittle & William Camp, (1999); and ILO, (1998). This framework, was useful in analyzing the success factors of KOPO Colleges.

The elements in the conceptual framework comprises of input and process elements that ensure production of a skilled workforce whose productivity leads to economic development. The input elements are the resources and conditions necessary for establishing an effective training infrastructure and include policy and advocacy; quality and standards; financing; and demand-driven data. The process elements analyses the management of the provision of training and education services and include organization and training provision; coordination and partnerships; access and participation; and M & E and feedback. The framework thus relates the resources and conditions (inputs), training service provision (process) to produce a skilled workforce (output) whose productivity leads to economic growth and development (outcome). The input and process elements are the independent variables of the study, skilled workforce is the intervening variable while economic growth and development is the dependent variable.

**Figure 4: Conceptual Framework for the Study**



**Source:** Researcher own development

## 2-2 Definition of Variables in the Framework

### 2-2-1 The Input Elements in the TVET System

The input elements identified in the conceptual framework are policy and advocacy; quality and standards; financing TVET; and demand-driven TVET data.

## **i) Policy and Advocacy**

National and local leaders play an important role in creating a conducive environment for skills development system to thrive, (Chae, ChangKyun & Jaeho Chung, 2009). They develop the national vision and make the skills development systems a key component of the vision. They incorporate this in national development policies and plans, advocating for establishment of training systems and its support mechanisms like legal framework and budgetary allocation, (Young-Sun Ra; & Soon-Hee Kang, 2012; Jeong, Taek-soo, 2008).

## **ii) Quality and Standards**

Observing quality and standards is the core foundation of a credible, effective and reliable training system. This priority area focuses on the teaching and learning process and its effectiveness to ensure the system produces a workforce that meets the demand and standards of the labor market. Availability of learning facilities and equipment like equipped libraries, ICT infrastructure, learning and practice halls, equipment for practical learning and instructional materials is fundamental to the provision of high-quality training, (Chae, ChangKyun & Jaeho Chung, 2009; Jon Lauglo, 2006; World Bank, 2013). There should be mechanisms in place to ensure there is quality assurance, skills testing and certification framework, accreditation criterion and the means of enforcing the standards. The overall oversight responsibility of the skills development system should be clearly elaborated



through a legal framework, ensuring autonomy with accountability. The World Bank, (2013) emphasizes the importance of establishing mechanisms for life-long learning and flexible pathways for students who wish to access programs in other fields and change skills, progress to other academical or vocational education and training programs or start working and recognition of prior learning for those already in the workforce.

### **iii) Financing TVET**

Financing is a great determinant of relevance, equity, quality and effectiveness of a training system, (World Bank, 2013; Jon Lauglo, 2006). When TVET is poorly funded, as often the case in developing countries, training providers are unable to satisfy employer's expectations and in response, employers do not hire the trainees provided by the system. The training system is funded through the government budget, employers' contributions (training levy), private funds, funds provided by development partners, revenue from income generating activities undertaken by the training institutions and user fees charged on trainees, (Young-Sun Ra; & Soon-Hee Kang, 2012). The Incheon Declaration and Framework for Action 2015, requires countries to allocate a minimum of 4% to 6% of GDP to education or allocate a minimum of 15% to 20% of annual public expenditure on education, (UNESCO, 2015a). Given the massive resources required for training, it is important for countries to develop policies, partnerships and establish institutional arrangements that will ensure sustainable and adequate funding.

#### **iv) Demand-Driven TVET Data**

The main objective of establishing training institutions is to develop the skills required by a country's labor market, and as such, the system has to be responsive to the dynamics of the labor market, (World Bank, 2013; ILO, 2004). TVET institutions should understand the trainees' transition to labor market, challenges and the labor market absorption capacity including emerging trends. To achieve this, training institutions and policy makers require reliable and updated data on current and emerging skills demands and the economic development priorities of the country and engage employers in developing a roadmap for the training sector, (Young-Sun Ra; & Soon-Hee Kang, 2012). The data should come from a deliberate process of thorough engagement with all stakeholders; training providers, government agencies, private sector and CSOs, (Chae, ChangKyun & Jaeho Chung, 2009).

#### **2-2-2 The Process Elements in the TVET System**

The process elements in the TVET system identified in the conceptual framework are Organization and Training Provision; coordination and partnerships; access and participation; and M & E and feedback.

## **v) Organization and Training Provision**

This priority area addresses how the TVET system is organized and governed to ensure that training is effective, relevant and responsive to the standards set by the labor market. Skills demanded are diverse and keep on changing as the economic development priorities and industry structures change and thus it is impossible to predict with precision what skills set will be required tomorrow. To mitigate this, there should be diversity in TVET service providers, where training is provided by both state and non-state actors. The government should take a lead role in regulating the whole skill development system to ensure accountability and relevance to economic development priorities, (World Bank, 2013).

The role of government, industrialists, employers and other stakeholders must be spelt out from the on-set in regard to day today running of the institutions, setting standards, participation in designing training curricula, development of new programs and advice on technical specifications for training facilities and equipment and creating field training opportunities for students in form of apprenticeships, internships and supporting professional development of instructors and administrators, (Young-Sun Ra; & Soon-Hee Kang, 2012; Susan Nguire, 2018). As the outcome of the training program is only as effective as the competencies of the trainers, training institutions should have a criterion for recruiting qualified instructors, support their professional development through in-service training and

supplement their expertise with industry practitioners who can take part in the teaching, (World Bank, 2013).

## **vi) Coordination and Partnerships**

For a training system to achieve a high match between skill demand and skill supply, there has to be a strong and effective coordination between TVET providers, government, private sector who are the users of the skills, (ILO, 2004). Coordination enables the training system to achieve policy coherence, better management, oversight and improve efficiency which ensures that skills development efforts are aligned to socio-economic priorities of the country. The employers, private sector and CSO have to be involved in setting national economic development priorities, identifying the skills demand, designing curricula and participating in training provision and are also instrumental in supplementing the training resources provided by the government. Coordination is critical in developing partnerships with the stakeholders who are involved in TVET provision, (Young-Sun Ra; & Soon-Hee Kang, 2012; World Bank, 2013). Effective coordination requires that top leadership sets the agenda and initiates the coordination mechanisms to overcome barriers among sector, agencies and industries at lower level.

## **vii) Access and Participation**

This thematic area analyzes the mechanisms that are established to ensure that the training system addresses the development priorities of the disadvantaged groups like youth, women, unemployed, people living with disabilities, people from marginalized communities and rural areas, (World Bank, 2013). The TVET programs implemented should not only promote equitable access but also focus on expanding training opportunities for disadvantaged groups to increase their participation.

## **viii) Monitoring, Evaluation and Feedback**

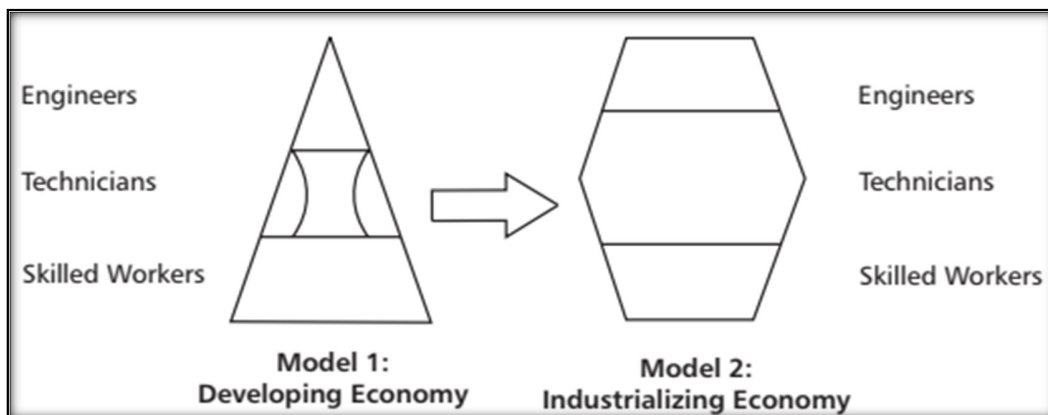
Feedback provided through monitoring is crucial for evaluating effectiveness of the training as it allows to assess whether the training system is delivering on expected outcomes. Monitoring entails timely collection of progress data, analysis and dissemination to stakeholders. The data is collected by different entities and at different levels; at institutional level, data on enrolment, staffing, budget execution and periodic achievements is compiled on routine basis and this serves as a tool for accountability, (World Bank, 2013). Beyond the institution level data on skills gap, skills mismatches and performance of trainees at work is important as it enables relevant authorities to identify gaps or challenges in training provision and take corrective action. When the monitoring and evaluation systems are not well developed, it's not possible to assess quality of services provided, progress on achieving

expected outcomes and the impact of the training programs on labor market outcomes, (Young-bum Park & Jung-woo Kim. 2017; UNESCO, 2010).

### **2-2-3 Skilled Workforce**

A skilled workforce refers to workers who possess knowledge and skills acquired through training, are capable of performing specific complicated tasks and have the ability to adapt to technological changes and creative application of knowledge and skills. ADB, (2004), elaborated the desired ratio of skilled workforce in a developing economy that seeks to transition to an industrializing economy as 1:5:25 for engineers to technicians to skilled workers which when met, a country can achieve skill-based competitiveness and transition to an industrializing economy characterized by more technicians, (see figure 5). ADB observed that the priority in developing economies should be to increase investment in education and training to achieve universal secondary education, deepen TVET for developing technicians and enhance labor force skills through life-long learning.

**Figure 5:** Workforce Structure Model for Developing and Industrialized Economies



**Source:** Adopted from Asian Development Bank, (2004)

#### **2-2-4 Economic Growth and Development**

Whereas economic growth implies the increase in the national output as measured by the real GDP, economic development is a broader term defined by Wikipedia as “the process by which a nation improves the economic, political and social well-being of its people.” Economic development is associated with economic growth accompanied by improved productivity of firms and people, better incomes and improved standards of living of individuals in a country. ADB, (2004) noted that economic growth and development results from improving productivity, high wages and profits that in turn leads to increased savings and investment.

World Bank, (1999) noted that there are three ways through which a country can develop – first by developing unexploited land, second by accumulating physical capital and third by expanding the labor force through increased education and training. While analyzing the impact of knowledge on economic development, the report established that by 1955, the GDP per capita of South Korea and Ghana was approximately \$300 but by 1990, the GDP Per capita of Ghana remained unchanged while that of South Korea had increased to \$7,500. Analysis of South Korea’s growth showed that a third of the growth within the period 1955 – 1990 was attributed to increase in educational attainment, R & D and a knowledge-driven industrial policy while two-thirds of growth was attributed to improved labor productivity and innovations, thus stressing the need for a skilled workforce, (World Bank, 2010).

### **3. Theoretical Framework and Empirical Literature Review**

#### **3-1 Theoretical Framework**

The study relied on two sets of theories; theories that present the skills formation process and theories that connects the channels through which a skilled workforce leads to economic development.



### **3-1-1 Constructivism Theory**

The constructivism theory is a theory of learning resting on the foundation that learners have the ability to “construct their own knowledge and meaning from their experiences” and “learners learn by doing rather than observing as they bring prior knowledge into a learning environment and they critique and re-evaluate their understanding of the subject matter repeatedly until they fully comprehend”, (Fosnot, 1996). Peter Doolittle & William Camp, (1999) noted that constructivism rests on four essential principles; knowledge is not passively accumulated, but is a result of individual cognizing; cognition is an adaptive process that functions in a given environment; cognition makes sense of one's experience; and knowing depends on biological/neurological construction and in social, cultural and language-based interactions. Through these principles, constructivism emphasizes the learner's active role in creation of knowledge and also realize that the knowledge created may vary in its degree of representing reality.

The role of training is to equip workers with skills for the world of work and in order for this to be realized, the society must identify employable skills and how the skills can be transmitted to learners. The system of imparting must ensure two things, first that the skills are relevant today and the learner is able to adapt to knowledge and skills required in the future and second, replace the concept that teaching is transmission of knowledge from teacher to learner with new concept based on learner knowledge construction and a

reciprocal relationship between teacher and learner, (Peter Doolittle & William Camp, 1999). Constructivists recommend that career and technical education should embrace five key concepts; acknowledge the role of prior knowledge in cognition; acknowledge the benefit of expert-based problem-solving strategies; acknowledge the dynamism of problem-solving strategies; acknowledge and recognize the impact of individual differences; and the ultimate goal of an occupationally equipped lifelong learner is to be productive.

### **3-1-2 Theory of Change**

The theory of change, also called ‘Program Theory’ is used to explain how an intervention contributes to realizing a chain of results that lead to achieving intended outcomes. The theory was promoted by Carol Weiss, (Weiss Carol, 1972) using it to explain how and why an initiative works. Weiss stressed the importance of identifying all the small steps that lead to achieving the long-term goal in the process of evaluating a program or an initiative. The theory can be used to develop a causal relationship that links program activities and inputs to outcomes and then used to guide evaluation of achieved results and explaining why an initiative works or does not. The theory takes cognizance that social programs like TVET are grounded on some explicit or implicit assumptions about how and why the program will work or not. To minimize chances of failure, all the assumptions built into the program must be identified and upon implementation, evaluation is undertaken to track progress and examine the assumptions to evaluate which holds/ does not hold, (Carol Weiss 1995).

The theory helps to set a desired long-term objective and once that has been done, to work backwards identifying all the activities that are required and drawing a relationship on how they relate and their contribution to achieving the desired objective and also mapping out contextual factors that are likely to affect implementation of activities which are then mapped in a framework that shows flow of activities to outcomes to long-term goal. The framework links individual activities to outcomes and helps to fully understand the problem, aids in planning, resource allocation and tracking of progress, (Carol Weiss 1995). In the context of TVET, the desired objective is to produce graduates with skills matching the demand of the labor market. Employing the theory of change framework involves mapping out the basic elements of an effective TVET system, identifying activities under each element and deriving a causal relationship among the activities and how they lead to production of skilled workforce. The framework illustrating this relationship is then developed recognizing contextual factors like the prevailing policy environment, government long term agenda, available legislations, the political landscape and general goodwill of the community that have a bearing on the outcome.

### **3-1-3 The Neoclassical Approach Theory (Free Market)**

The theory treats education and training as investments with future material payoffs, similar to investments in physical capital. It links the stock of skills with productivity whereby

human capital input shares equal status with physical capital inputs, (Ashton and Green 1996). The theory has its roots in Adam Smith work of 1888<sup>2</sup> where he says:

*“When any expensive machine is erected, the extraordinary work to be performed by it will replace the capital laid out upon it, with at least the ordinary profits. A man educated at the expense of much labor and time, may be compared to one of those expensive machines. The work, which he learns to perform, it must be expected, over and above the usual wages of common labor, will replace to him the whole expense of his education, with at least the ordinary profits of an equally valuable capital. The difference between the wages of skilled labor and those of common labor is founded upon this principle.”*

The neoclassicals view free market as an efficient system for determining supply and demand of education and training where entities in an economy calculate costs and expected future benefits before undertaking training investment decisions, (Ashton et al. 1999; G. Becker, 1964). A person will take training if projected future earnings are more than present training costs. Similarly, if there are insufficient skills but wages are sufficiently high, an individual is motivated to spent on training. The same principle applies to firms which only invest in training workers if their future productivity with the firm is projected to offset the costs of training.

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<sup>2</sup> Adam Smith. 1888. An Inquiry into the Nature and Causes of the Wealth of Nations. Longman & Co. London.

In a free market, investment in training takes care of itself but due to market failure, there is a discrepancy between private returns and social returns which makes investments in training and returns from training less than socially optimal. This is because there exist externalities, that is, the benefits of investment in training are received by parties other than the training firm, common where firms “poach” trained workers from other firms. The firm that ‘poaches’ the trained worker gets the benefits of training through improved productivity, though they didn’t incur the cost, a practice that explains why firms are reluctant to train workers. Secondly, there are labor market rigidities like lower wages, career progression guidelines which limit the motivation of workers to invest in their own training. Thirdly, there exist insufficient information about the future benefits of education and training which makes individuals not to invest in their own training, (Booth and Snower, 1996). The presence of externalities in the neoclassical model presents a case for government intervention by regulating, supporting and subsidizing the provision of TVET so that the disadvantaged groups can access training, (Ashton and Green 1996).

Booth and Snower, (1996) however, noted that firms’ skill requirements are numerous and as such, governments cannot be expected to know and provide them all hence the appropriate solution will be the government to finance, but not to provide the training. Betcherman, Olivas et al. (2004) observed that though youth training programmes have a much bigger impact due to the presence of few skilled workers, the large informal sectors in developing

countries and weaker program implementation capacity limits the success of many TVET interventions. In view of this, he presented a number of suggestions on the following interventions;

- a) *Training for the unemployed* which benefits participants by increasing employment rates though may not necessarily lead to higher earnings;
- b) *On-the job training* which has a higher impact on women than men especially with active employer involvement;
- c) *Training for youth* to be integrated with remedial education and job search assistance alongside investing earlier in the education system to reduce drop-outs and other schooling problems;
- d) *Retraining for workers in mass lay-offs* which may not have large positive impacts.
- e) *Making the labor market attractive to youth* through wage subsidies, public works and entrepreneurship programmes

### **3-2 Empirical Literature Review**

The Taskforce Report on Reforming the Education Sector in Kenya identified high costs of training materials and text books, inadequate physical facilities and inadequacy of modern equipment in vocational institutions as the primary reason why the institutions can't implement their curriculum effectively, (Republic of Kenya, 2012a). Among the mostly required but often inadequate resources in these institutions are automobile engines,

carpentry and masonry tools, sewing machines, computers, computer software, textbooks, stationery and most relevant in the 21st century, the internet (Mupinga et al., 2006). These deficiencies, the studies concluded, results to low acquisition of practical skills by the trainees and in effect, lead to production of unemployable graduates.

Other studies like UNESCO, (2010); Hailu, (2011); and Kigwilu and Akala, (2017) found out that effective curriculum implementation in many vocational institutions is hampered by inadequacy of physical infrastructure, modern and up-to date equipment, well-equipped workshops, practical and lecture rooms and trained instructors all which are relevant to the modern-day economy. These inadequacies, as observed by Sharma, (2008) are in effect caused by inadequate finances allocated to these institutions which shrink the budgets for acquiring modern tools and equipment, repairing old equipment and developing training materials.

#### **4. Research Methodology**

Basing on empirical literature review, and, in order to adequately investigate how KOPO Colleges have managed to produce graduates highly suitable to the Korean labor market, the study adopted a descriptive research design, (Creswell, J. W. 2011; Creswell J. W. & Plano Clark, 2011; Kigwilu and Akala, 2017) relying on quantitative and qualitative data from

secondary sources. The descriptive design was appropriate as it enabled the researcher to generalize the findings and also make a clear evaluation of the research problem.

The study used data from KOPO College website, website of ministry of Employment and Labor; Ministry of Education; and Ministry of Finance and Strategy. The study also used information from published sources by different research organizations in Korea - Global Knowledge Exchange & Development (GKED) Center, Research entities dealing in the field of TVET (KRIVET), the Human Resource Development (HRD) Services of Korea among others. The data collected was analyzed using a descriptive methodology.

## **5. TVET in the Era of the 4<sup>th</sup> Industrial Revolution**

There have been recorded four stages of Industrial Revolution (IR). The first IR took place towards end of the 18<sup>th</sup> century using water and steam power to mechanize production, the second occurring in the early 20<sup>th</sup> century and using electric power to create mass production while the third which began in middle of the 21<sup>st</sup> century used electronics and information technology to automate production. The fourth Industrial Revolution (IR 4.0) is taking shape now and is building on the third, characterized by a fusion of technologies that combines automation technology with cyber technology based on the development of artificial intelligence. While past revolutions focused on replacing human labor with machine, IR 4.0 replaces human' intelligent with artificial intelligence that improves efficiency, productivity



and technological innovations. IR 4.0 will exist in an industrial ecosystem built on an intelligent information society in which technologies like artificial intelligence<sup>3</sup> (AI), Internet of Things (IoT), Cloud Computing, Machine Learning, Robots, Big Data Analysis, 3D Printing and Biotechnology, and Mobile Platforms will be integrated into every aspect of society. IR 4.0 will alter the way people work and relate and the response to it must involve all stakeholders in public sector, private sector and the academia, (World Economic Forum, 2016).

IR 4.0 capitalizes on Intelligent Technology to enhance productivity and increase returns to scale and this will trigger fundamental reforms in the use of other production factors like labor and capital as well as the industrial structure. Automation associated with AI is bound to eliminate systematic repetitive jobs while creating other jobs in new emerging industries in Intelligent Technology<sup>4</sup> (IT) related industries like software engineering and data analysis leading to polarization of the employment structure. Human workers will be concentrated in creative and emotional activities, which machines cannot replace so easily. Policymakers

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<sup>3</sup> Artificial Intelligent refers to “intelligent software and hardware technologies capable of performing human cognitive functions (language, voice recognition, visual perception, emotional support)”.

<sup>4</sup> Intelligent Technology refers to “technology capable of performing functions of human intelligence by combining aspects of artificial intelligence (AI) with information provided by data-processing and network technologies such as Internet of Things (IoT), Cloud Computing, Big Data Analysis, and Mobile Technologies”.

need to devise measures that will involve training and re-training for people who will lose their jobs as the future workforce re-aligns to a new skillset to stay relevant in the job market, (Schwab, K. 2016).

The demand for a new skillset (see figure 6) implies that the education curricula has to be revised to accommodate the changed industrial ecosystem. Schwab, K. (2016) identifies the following key perspectives in which IR 4.0 will affect TVET;

- a) **The Education System:** The World Economic Forum, in its 2016 report observed that an estimated 65 % of children enrolling in primary schools today are bound to work in new jobs and industries that are non-existent today. As technology changes, new roles will be created that will require one to have both technical, social and analytical skills. Private sector, governments and civil society need to collaborate and develop new curricula that will move beyond the rote education system towards a problem-solving, critical-thinking centered education system.
- b) **Lifelong Learning:** Reforming the curricula today will ensure that today's students meet future skills requirements. However, modalities will have to be put in place to ensure that existing workers get a new set of skills throughout their lifecycle in the concept of lifelong learning. It will be prudent that governments, private sector and CSOs put in place measures to ensure workers are motivated and access retraining opportunities all their economically active life.

- c) **Collaborations:** Collaboration, rather than competition between governments, countries, industries, public-private will be the best strategy to achieve growth and develop future skills and employment needs. Partnerships between businesses, educational institutions and government will increase the quality of the talent pool and also ensure social stability, especially given the greater risk of many redundant skills.

**Figure 6: IR 4.0 Core Work Related Skills**

Abilities	Basic Skills	Cross-functional Skills	
<b>Cognitive Abilities</b> <ul style="list-style-type: none"> <li>» Cognitive Flexibility</li> <li>» Creativity</li> <li>» Logical Reasoning</li> <li>» Problem Sensitivity</li> <li>» Mathematical Reasoning</li> <li>» Visualization</li> </ul>	<b>Content Skills</b> <ul style="list-style-type: none"> <li>» Active Learning</li> <li>» Oral Expression</li> <li>» Reading Comprehension</li> <li>» Written Expression</li> <li>» ICT Literacy</li> </ul>	<b>Social Skills</b> <ul style="list-style-type: none"> <li>» Coordinating with Others</li> <li>» Emotional Intelligence</li> <li>» Negotiation</li> <li>» Persuasion</li> <li>» Service Orientation</li> <li>» Training and Teaching Others</li> </ul>	<b>Resource Management Skills</b> <ul style="list-style-type: none"> <li>» Management of Financial Resources</li> <li>» Management of Material Resources</li> <li>» People Management</li> <li>» Time Management</li> </ul>
<b>Physical Abilities</b> <ul style="list-style-type: none"> <li>» Physical Strength</li> <li>» Manual Dexterity and Precision</li> </ul>	<b>Process Skills</b> <ul style="list-style-type: none"> <li>» Active Listening</li> <li>» Critical Thinking</li> <li>» Monitoring Self and Others</li> </ul>	<b>Systems Skills</b> <ul style="list-style-type: none"> <li>» Judgement and Decision-making</li> <li>» Systems Analysis</li> </ul>	<b>Technical Skills</b> <ul style="list-style-type: none"> <li>» Equipment Maintenance and Repair</li> <li>» Equipment Operation and Control</li> <li>» Programming</li> <li>» Quality Control</li> <li>» Technology and User Experience Design</li> <li>» Troubleshooting</li> </ul>
		<b>Complex Problem Solving Skills</b> <ul style="list-style-type: none"> <li>» Complex Problem Solving</li> </ul>	

**Source:** World Economic Forum, (2016). The Future of Jobs: Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution.

## **6. Conclusion**

The chapter explained the mixed methods research design used in the study and the conceptual framework guiding this study. Through the framework, the essential elements of an effective skills development system were identified comprising the input and process elements. The theoretical framework was presented explaining the theories that present the skills formation process and those that explain how a skilled workforce leads to economic development and finally ended by elaborating the empirical studies on impact of training on economic development and explaining the advent of IR 4.0 and its impact on TVET.

## **CHAPTER III: TVET AND KOPO COLLEGES IN KOREA**

### **1. Introduction**

The chapter presents an overview of the education system in Korea to enable understand the position of vocational training and ultimately KOPO Colleges. It starts by an analysis of the overall education system, then narrows down to vocational education, looking at the early practices and the modern-day training and finally provides a detailed analysis of the development of KOPO Colleges.

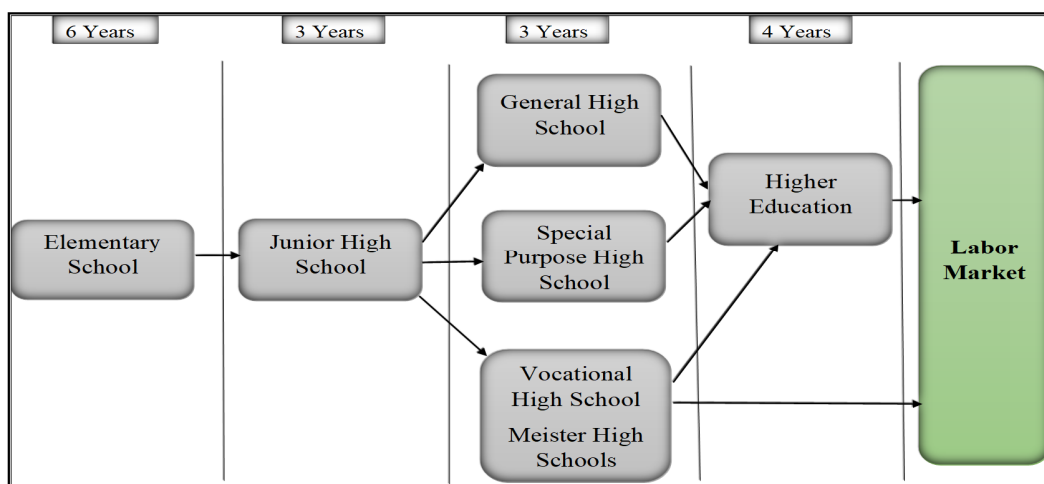
### **2. Overview of the Education System in Korea**

#### **2-1 The Basic Education System**

The education system in South Korea is elaborated as 6-3-3-4 system consisting of elementary school (six years), junior high school (three years), high school, (three years) and university and graduate school (four years) as shown by figure (see figure 7). Compulsory education comprises elementary and junior high school and upon graduating from junior high school, one may advance to a 3-year in a general high school, special purpose high school or vocational high school, (Republic of Korea, 2017; KRIVET, 2013). General high schools provide education for students intending to pursue higher education with academic focus. Special purpose high schools specialize in fields such as natural sciences, foreign

languages, arts and physical education. Meister high schools are a special type of special purpose high schools that offer programmes directly linked to industrial demands. Vocational high schools recruit students who seek employment after graduation, though some pursue higher education.

**Figure 7: Korea Education System**



**Source:** Researcher Compilation from MOET records, 2020

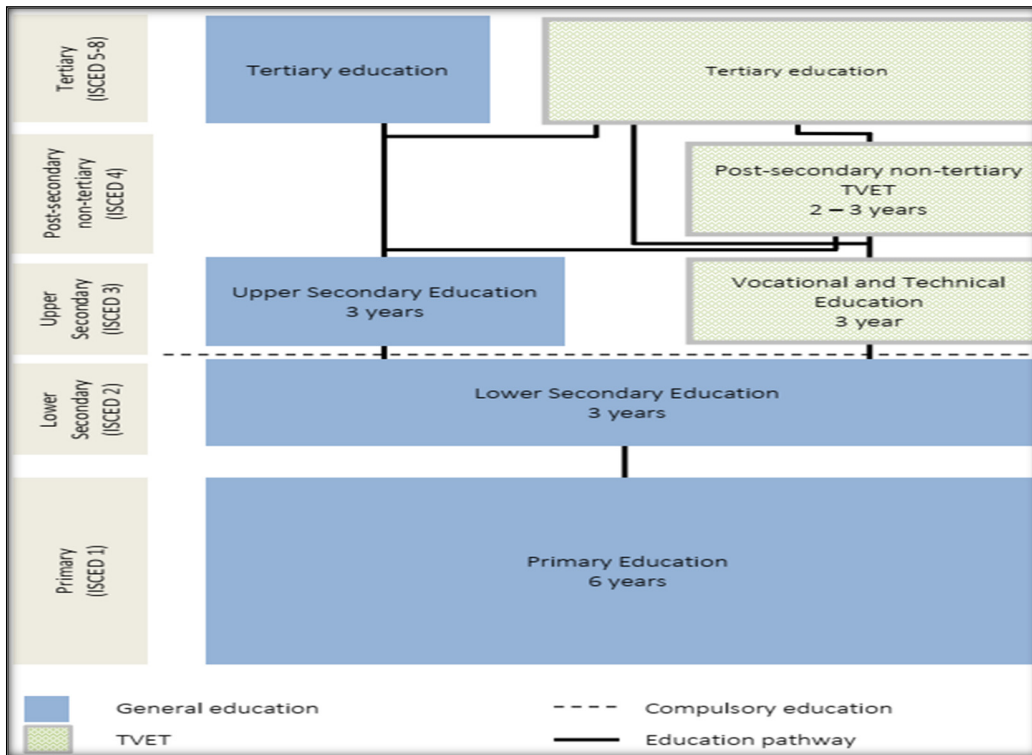
## 2-2 TVET in Korea Education System

The path of vocational training and education in Korean education system is presented (see figure 8). TVET is offered at the upper secondary level (ISCED 3), lasting for three years and is taught in vocational high schools managed by the Ministry of Education. Graduates from this level can join universities for four-year degree programs or formal vocational

colleges managed by the Ministry of Education or polytechnic colleges managed by the Ministry of Employment and Labor (ISCED 4). Upon graduation from the vocational or polytechnic college, graduates either choose to enter the labor market and start working or go to universities at the tertiary level (ISCED 5), (UNESCO-UNEVOC, 2018b).

At tertiary level, universities and polytechnics provide vocational training ranging from one to two years for non-degree courses and three to four years for degree courses. The tertiary institutions in Korea include the Korea Polytechnics, HRD center under KCCI and private vocational training institutions, (UNESCO-UNEVOC, 2018b). Korea polytechnic (KOPO) Colleges develop industrial workers with emphasis on technicians and craftsmen. They offer industrial degree and associate degree courses for master technicians and craftsmen courses, (KRIVET, 2013; Chae, ChangKyun & Jaeho Chung, 2009; and Jeong, Taek-soo, 2008).

**Figure 8: TVET in Korea Education System**



**Source:** UNESCO-UNEVOC, 2018b

### 3. The Development of TVET in Korea

Until late 1960s, Korea was an underdeveloped agricultural economy with large portions of low-technology manufacturing being undertaken by cottage industry. Rural-urban migration was experienced in large numbers which resulted to high unemployment rates. It was during this time that the new regime of President General Park launched its first 5-year Economic



Development Plan in 1962 with major focus on development of light, labor-intensive and import-substitution industries like textiles and manufacturing, with the expectation that the labor-intensive industry will absorb the excess labor in the country, (Young-Sun Ra and Soon-Hee Kang, 2012; Chae, ChangKyun and Jaeho Chung, 2009). At the time, although vocational high schools were in existence, their traditional build-up system and the three-year period required to complete a training course made it unable to meet the labor market demand. Government tried several makeshift measures to train and supply skilled workers, including introduction of temporary technical training courses within vocational high schools that provided one-year training courses but this only produced a mere 480 skilled workers annually. To develop a large number of skills on a wider scale and in a short time, the government introduced a vocational training system with the enactment of the Vocational Training Act in 1967 which was intended to promote development of skilled workers through non-formal, in-plant and public training, (Young-Sun Ra; and Soon-Hee Kang, 2012).

The government introduced the obligatory in-plant training system under the Basic Vocational Training Act in 1976 to supplement government training efforts. The training in public institutions was fully financed by government and trainees were issued with training suits, shoes and provided with a free room and board and housing provided for instructors. Unskilled people received various incentives, including introduction of technical

qualifications system in 1973 which served as an incentive, as well as a training goal to enroll in the training institutions. Practice classes accommodated 15 trainees to enhance person-to-person training with 1,900 hours of annual training, of which more than 70 % were allocated to practice. The vocational training system, along with the obligatory in-plant training complemented the public formal vocational education, improved quality owing to the skill testing system (ChangKyun and Jaeho Chung, 2009; Kim, L. 1997; Ki-Hong Kim., 2001) and built a strong base of skilled workforce.

Today, the TVET system operates in two forms (see figure 12) TVET institutions that are part of the official educational system managed by the Ministry of Education (vocational high schools and junior colleges) and TVET institutions that are meant for human resource development managed by the Ministry of Employment and Labor with its affiliate organs like the Human Resource Development Institute and the Korea Chamber of Commerce and Industry (KCCI), (UNESCO-UNEVOC, 2018b).

**Table 1:** Type of TVET institutions in Korea

<b>Type of TVET Institution</b>	<b>Education Level Offered</b>	<b>Ministry Responsible</b>	<b>No. of Institutions</b>
Specialized Vocational High Schools	Upper Secondary (ISCED 3)	Ministry of Education	495
Meister High Schools	Upper secondary (ISCED 3)	Ministry of Education	50
Vocational Colleges	Associate Bachelor's	Ministry of Education	137
Polytechnic Colleges	Up to Associate Bachelor's	Ministry of Employment and Labor	34

Type of TVET Institution	Education Level Offered	Ministry Responsible	No. of Institutions
HRD Centre, Korea Chamber of Commerce and Industry	Upper Secondary (ISCED 3)	Ministry of Employment and Labor	8
Vocational Training Centre, Korea Employment Agency for Disabled	Upper Secondary (ISCED 3)	Ministry of Employment and Labor	8

**Source:** UNESCO-UNEVOC, Korea TVET Profile, 2018

## 4. Korea Polytechnic (KOPO) Colleges

### 4-1 The Development of Korea Polytechnic (KOPO) Colleges

KOPO colleges are a special type of vocational training institutions established to develop industrial workers with emphasis on field and practical work i.e technicians and craftsmen. KOPO Colleges mainly target non-college-bound youth, the unemployed and women with no academic qualifications. KOPO colleges offer two-year multi-skilled engineer courses and one-year craftsman courses, (ChangKyun and Jaeho Chung, 2009; Young-Sun Ra; and Soon-Hee Kang, 2012). In 1982, Korea Vocational Training Management Agency (present day HRD Service of Korea) was established to operate the vocational training system, oversee skills testing and manage public vocational training facilities, tasks previously done by the Ministry of Science and Technology and Ministry of Labor respectively, (Young-Sun Ra and Soon-Hee Kang, 2012). In 1990, the government

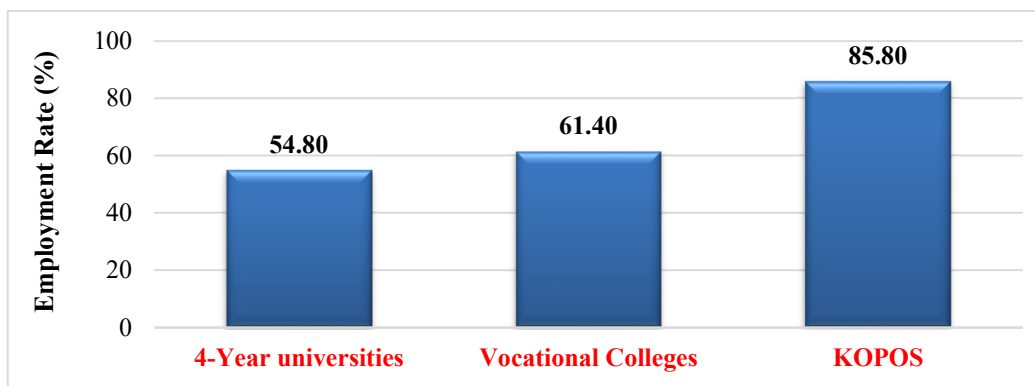
constructed the Joint Vocational Training Institute using money collected from the Vocational Training Promotion Fund, whose major contributor was the private sector.

In a bid to enable private sector take a lead role in vocational training, the government transferred control of the Institute to Korea Chamber of Commerce and Industry (KCCI) in 1993. In 2005, all public vocational training infrastructure was consolidated and the task of providing vocational training was removed from HRD Service of Korea and transferred to Korea Polytechnics previously called polytechnic colleges. KOPO colleges have earned fame due to the high employment rates of their graduates whose training suits the labor market needs and most notably the 1997 amendments that allowed them to offer Industrial Associate's Degree to graduates of multifunctional technician courses. Today, KCCI runs eight KOPO colleges spread across thirty-four campuses in Busan, Gunsan, Gwangju, Incheon, Gyeonggi, Okcheon, Hongcheon and Gongju, (see Appendix 1).

## **4-2 The Success of KOPO Colleges**

KOPO Colleges operate a field-oriented education system which is based on a close industry–academia cooperation in technological trend analysis, field practice and competence improvement trainings. The programs are tailored to the needs of corporate partners where most of the graduates are employed through the Dedicated Corporate Operation System. A ranking of employment rates among vocational institutions showed that of the top 30 Vocational training institutes nationwide with the highest employment rate, 23 were KOPO College campuses. A study by the Ministry of Education for employment rates carried out in 2015 (see figure 9) show that 85.8% of all graduates from KOPO Colleges get employment in the first year as opposed to 61.4% from Vocational Colleges and 54.8% from four-year university courses.

**Figure 9:** Korea Employment Distribution of Graduates by Type of Institution, 2015



Source: <http://www.kopo.ac.kr/en/content.do?menu=1305> (Retrieved; 2020/07/03)

## 5. Conclusion

This chapter has presented the overall structure of the education system in Korea and clearly elaborated the position of vocational training and ultimately KOPO Colleges. The chapter finalizes by providing a detailed analysis of the development of KOPO Colleges which trains artisans and craftsmen in low skill jobs. The close industry–academia cooperation between KOPO Colleges and the private sector has ensured that most graduates are employed through the Dedicated Corporate Operation System with KOPO Colleges registering high employment rates of their graduates among all the training institutions in Korea.

## **CHAPTER IV: DISCUSSION ON THE SUCCESS FACTORS OF KOPO COLLEGES**

### **1. Introduction**

The purpose of the study was to investigate the success factors of KOPO Colleges with a view to making policy recommendations for youth polytechnics in Kakamega county. This chapter presents a discussion on the findings based on the data collected from the website of KOPO Corporation and other published sources by KDI, KRIVET, government ministries and agencies among others.

### **2. Data Collection**

The main source of data for the study was the website of KOPO Corporation (<http://www.kopo.ac.kr/index.do>) which provided critical data on the various elements of study as implemented by the campuses. The researcher also collected and used data from published sources (books, journal articles, websites) from; KRIVET and KDI; government ministries and agencies - Ministry of Employment and Labor; Ministry of Education; Ministry of Strategy and Finance; and HRD Service of Korea and private organizations like KCCI among others. The data collected from KOPO Corporation website was supplemented by the information collected from the other sources and the foregoing discussion is based on these findings.

### **3. The Role of Vocational Training in Korea Economic Development**

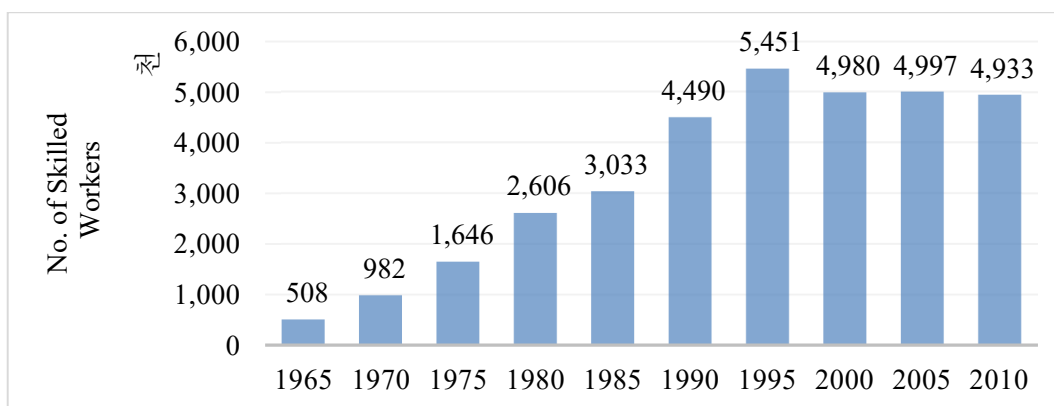
Introduction of vocational training in Korea increased skilled workers and improved the quality of workforce, evidenced by Korea winning the World Skills Competition - a craftsmen's Olympic that demonstrates excellence in vocational skills. In 1977 Korea finished first by winning 12 gold, 4 silver, and 5 bronze medals, a trend that continued until 1991 where Korea had won first place nine times in a row. Going by numbers, in 1965 the skilled workforce was 508,000 people but with the implementation of vocational training programs, the skilled workforce increased to 1.6 million in 1975, to over 3 million in 1985 and was over 5 million by 1995, (see figure 10). Within this period, the labor market achieved near full employment as recorded unemployment rates between 1987 and 1997 averaged 2.4% annually, (Young-Sun Ra; and Soon-Hee Kang, 2012).

As explained by the Neoclassical approach theory, education and training are investments with future material payoffs and the skilled workforce is a resource endowment to countries where initial stocks of human capital are large and idle. Investing in education and training was key in the early stages of development of Korea as it increased the quantity of skilled workers and improved the quality of workforce leading to improved productivity, innovation and enhancing competitiveness of national industries. But as the economy developed, technological shift occurred, industries changed production techniques from labor-intensive to technology-intensive. This resulted to reduced need for skilled workers which has limited



the role of vocational training. Today, the development phase that Korea is undergoing, coupled with the emergence of I.R 4.0 has shifted the demand for skills to high-tech industries where engineers and scientists have taken the place of skilled workers, vocational training is slowly waning.

**Figure 10:** Growth of Skilled Workers in Korea for the Period 1965 - 2010



**Source:** Myungsoo, Park. In Human Development: Education and Health Policy

#### 4. Understanding the Success Factors of KOPO Colleges

Basing on the tenets of the constructivism theory that learners have the ability to construct their own knowledge based on their experiences in a given environment and the knowledge constructed depends on social, cultural and language-based interactions, it follows that, first, the society must identify relevant market demanded skills, second, create the environment of transmitting the skills to learners, and third, ensure that the skills are not only relevant today but develop mechanisms to enable the learner adapt to skills required in the future. A

conducive training environment was created with various interventions in TVET being made that contributed to KOPO colleges being effective. The discussion presented in this part is based on the priority areas identified in the conceptual framework in chapter II.

## **4-1 The Input Elements in the TVET System**

### **4-1-1 Policy and Advocacy**

Under this priority area, the researcher sought to establish the role national and local leaders, businesses and industry play in articulating the need for training as a key ingredient of national economic and social development goals and creating a conducive environment for training to thrive.

#### **a) Policy**

Legislations are the foundation that provides the framework for policy implementation, thus Korea vocational training policies evolved and developed along with the relevant legislations, (Young-Sun Ra; and Soon-Hee Kang, 2012). As evidenced (see table 1), several legislations were enacted to lay the foundation for vocational training.

**Table 2: Laws Enacted to Support Vocational Training**

<b>Act</b>	<b>Year enacted</b>	<b>Purpose</b>
<b>The Vocational Training Act</b>	1967	Introduced formal vocational training system to develop skilled workers through non-formal, in-plant and public training
<b>National Technical Qualifications Act</b>	1973	Provided mechanisms on skills testing by establishing the national technical qualification system
<b>Vocational Training Special Measures Act</b>	1974	Introduced obligatory in-plant training system
<b>Basic Vocational Training Act</b>	1976	Combined Vocational Training Act and Vocational Training Special Measures Act and introduced vocational training levy system. Amended in 1982 to establish HRD Service of Korea to improve efficiency of public vocational training
<b>The Vocational Training Promotion Fund Act</b>	1976	To ensure funds from vocational training levies were spent on projects that promote vocational training
<b>Polytechnic College Act</b>	1977	Provided mechanisms for establishment of polytechnic colleges; Amended in 1997 to introduce Industrial Associate's Degree offered to graduates of multifunctional technician courses
<b>Employment Insurance Act</b>	1995	Introduced the Employment Insurance System and abolished obligatory training system
<b>Workers Vocational Training Promotion Act</b>	1999	Replaced the Basic Vocational Training Act. Purpose was to promote employment, raise socio-economic status & develop vocational skills of workers and improve productivity of firms; Established the foundation for promoting private vocational training; and Unified vocational training funds into Vocational Skills Development Project Fund.
<b>Workers Vocational Skills Development Act</b>	2004	Replaced the Workers Vocational Training Promotion Act

Act	Year enacted	Purpose
		Purpose was to stabilize employment of workers, improve productivity of enterprises and promote workers' socio-economic status and lifelong vocational skills development Amended in 2015 to respond to transition towards knowledge economy and lifelong learning society

**Source:** Young-Sun Ra; and Soon-Hee Kang, 2012.

## **b) Advocacy**

National leaders played an important role in creating a conducive environment for vocational training to be implemented. They developed a national vision manifested through the 5-year economic development plans and made training a key ingredient of the plan. The advocacy and commitment expressed by the national leaders led by President General Park and leaders in private sector was key in creating partnerships and building public support that enabled massive training to take place, (ADB, 2004; Young-Sun Ra and Soon-Hee Kang, 2012). The changes in vocational training priority went along with the different stages of development the country was going through, (see table 2).

**Table 3: Stages of Development of Education and Training in Korea**

Stage of Development	Period	Development of Education and Training
<b>1. Import Substitution (1<sup>st</sup> and 2<sup>nd</sup> five-year Economic Development Plans)</b>	1945—1960	Universal primary education and adult literacy
	1960s	<ul style="list-style-type: none"> <li>a) Expansion of basic education up to middle school</li> <li>b) Establishment of public vocational high schools</li> <li>c) Creation of 2-year junior colleges</li> <li>d) Creation of vocational training institutes for non-formal skills development under MOL</li> </ul>
<b>2. Export-Oriented Industrialization (3<sup>rd</sup> and 4<sup>th</sup> five-year Economic Development Plans)</b>	1970s	<ul style="list-style-type: none"> <li>a) Increase proportion of secondary students in vocational high schools;</li> <li>b) Emphasis on engineering and science in junior colleges;</li> <li>c) Law enacted stipulating quotas for Enterprise-Based Training (EBT), later renamed Training Levy</li> </ul>
<b>3. Trade Liberalization (5<sup>th</sup> and 6<sup>th</sup> five-year Economic Development Plans)</b>	1980s	<ul style="list-style-type: none"> <li>a) Increase proportion of secondary students in vocational high schools;</li> <li>b) Emphasis placed on post-secondary technical courses and advanced training in science and technology;</li> <li>c) Levy system expanded to encourage On-The-Job Training (OJT);</li> <li>d) Rapid expansion of higher education (18%/year in 1<sup>st</sup> half of 1980s)</li> </ul>
<b>4. Higher value-added production and technology</b>	1990s 2000s	<ul style="list-style-type: none"> <li>a) Entry into globalized economy and fall in economic growth;</li> <li>b) Diversifying higher education, allowing vocational high school graduates to access higher education;</li> <li>c) Decentralization to stimulate innovation and expansion of R &amp; D.</li> </ul>

**Source:** Asian Development Bank, 2004

#### **4-1-2 Quality and Standards**

Under this priority area, the researcher sought to investigate the teaching and learning processes and its effectiveness in ensuring KOPO Colleges produces trainees who meets the standards of the labor market. A number of elements were analyzed as follows;

##### **a) Oversight Responsibility for KOPO Corporation**

The overall oversight mandate of KOPO Colleges is with the Ministry of Employment and Labor which is responsible for establishing and administering policies on vocational training. Such policies include developing or amending laws and regulations governing vocational training; certifying and designating training courses; designating and managing training centers; expanding training infrastructure; evaluating training institutions and subsidizing training costs. The ministry also manages the provision of training allowances to eligible trainees, (Republic of Korea, 2020).

##### **b) National Technical Qualification System**

Young-Sun Ra and Soon-Hee Kang, (2012) defines National technical qualifications as signals in the labor market that reflect the skills and capabilities required by industries. The National Technical Qualifications Act was enacted in 1973 and established the national technical qualification system that provided mechanisms for skills testing under the Korean Technical Testing Service in order to assure the credibility of certificates awarded to

successful trainees and promote efficiency. The Ministry of Labor is responsible for overseeing implementation of the National Technical Qualification System while other ministries and government agencies are responsible for utilization of certificate holders. The HRD Service of Korea and the Korea Chamber of Commerce and Industry (KCCI) are in charge of carrying out qualification tests with such functions as setting examination questions, establishing examination plans, undertaking actual testing, issuing certificates and managing qualification holders. The skills testing mechanism was made mandatory by the government and administered in two-fold – written tests and practical tests. Once the implementation of technical qualification system was underway, efforts were made to improve the social status of certificate holders tested, (Jae Hyun Park; et al 2012).

Just as the vocational training changed to reflect the different development phases the country was going through, the national technical qualification system was changing to stay relevant and contribute to improving workers' vocational skills and productivity. Jae Hyun Park; et al (2012). observes that there were 556 qualifications under enforcement in the year 2010. The Ministry of Employment and Labor (2020) reports that this number had increased to 586 by 2020 classed in the categories of professional engineers (89), engineers (112), industrial engineers (125), master craftsman (28), craftsmen (198) and business service (34), (Republic of Korea, 2020).

### **c) National Competency Standards**

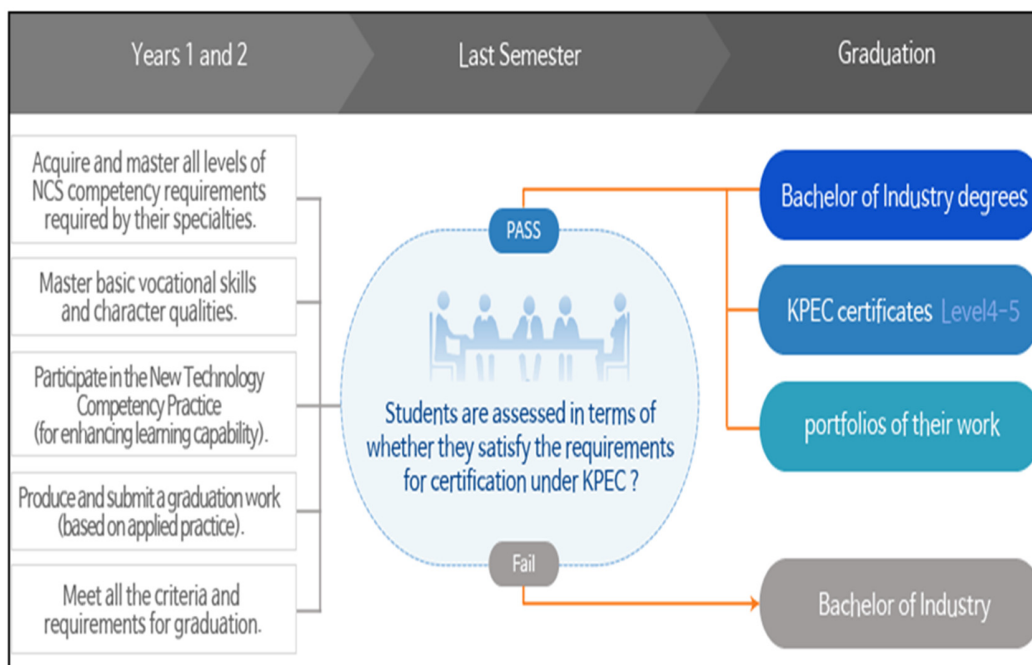
The National Competency Standards (NCS) are a set of knowledge, skills and attributes required to perform a particular job in a given industry and are standardized by the State and by the relevant industry and competency level. NCS are developed by the Ministry of Employment and Labor and the HRD Services of Korea in consultation with relevant industries and other stakeholders, (<http://www.hrdkorea.or.kr/ENG/8/1>). The training provided by the different actors in Korea is designed to ensure that all trainees acquire the competency units prescribed in NCS.

### **Application of the National Competency Standards (NCS) and the National Technical Qualification Framework by KOPO Colleges**

Korea Polytechnics aims to develop a competent workforce under the National Technical Qualification Framework based-curriculum and certification system. The KOPO Colleges offer Korea Polytechnic Education Certificate (KPEC), (see figure 11) which is a certification program that is based on the National Competency Standards and the National Technical Qualification Framework, (<http://www.kopo.ac.kr/en/content.do?menu=8154>, Retrieved 2020/09/25).



**Figure 11:** An illustration of Korea Polytechnic Education Certificate (KPEC) Flow



**Source:** <http://www.kopo.ac.kr/en/content.do?menu=8154> (Retrieved 2020/09/25)

#### **d) Education Pathways and Lifelong learning**

The rapid pace at which technological advancement is affecting organization of economic activities implies that job markets are becoming very volatile. Jobs that are not competitive are destroyed and new ones created in more competitive fields within a short time span. In response, workers have to keep their skills up-to-date to the new economic conditions through training so as to remain relevant in the job market and actively employed. In view of this, the concept of life-long learning, which entails acquisition of skills throughout one's

economically active life has become an economic necessity. The effectiveness of lifelong learning is only realizable in the existence of mechanisms to recognize prior learning and clear pathways where trainees can transfer across courses, progress to higher levels of training or gain access to programs in other fields, (World Bank 2013).

Recognizing the importance of developing pathways that links vocational training with the mainstream formal education, the Polytechnic College Act was amended in 1997 December to introduce an Industrial Associate's Degree offered to graduates of multifunctional technician courses (<http://www.kopo.ac.kr/en/content.do?menu=1301>, Retrieved 2020/09/25). Following this, the Ministry of Education, Science, and Technology in 1998 accredited KOPO Corporation and allowed Industrial Associate's Degree graduate (two-year regular course covering 20 job categories) to receive a Bachelor of Industrial Engineering and become eligible to enroll into the junior course of the four-year regular university.

#### **4-1-3 Financing TVET**

Under this priority area, the researcher sought to find out how KOPO Colleges resources are allocated to KOPO Colleges and mechanisms in place to ensure the resources prudently used and are sufficient to meet training needs.

Funding for vocational training in Korea was achieved through a number of strategies based on the development phase of the country. The funds come from two sources – the public sources financed by the general account budget of the central government and local governments, the private resources collected through the training levy system and the independent resources of private institutions, tuition payment by trainees and contributions from donors, entrepreneurs or private organizations, (<http://english.moe.go.kr/sub/info.do?m=020108&s=english>, Retrieved 2020/09/23).

Upon enactment of the Vocational Training Act in 1967, the government provided training subsidies to large corporations to initiate in-plant training that would run alongside the mainstream vocational training being implemented by the government. With the enactment of the Vocational Training Special Measures Act in 1974 that introduced the obligatory in-plant training system, the government made it mandatory for firms of a particular size to undertake in-plant training and those unable to do so paid training levies instead. This move was to encourage firms to take a lead role in developing and supplying the skilled workers required in the early stages of industrialization, (Young-Sun Ra; and Soon-Hee Kang, 2012).

With enactment of the Basic Vocational Training Act in 1976 that allowed the government to collect training levies, vocational training was financed by resources collected from the training levy fund and generally supported by the budget from the general account. Upon enactment of the Employment Insurance Act in 1995, the training levies were renamed

employment insurance premiums and are imposed on all enterprises, then collected through the Vocational Skills Development Project Fund where all enterprises paid training levies as part of employment insurance system and received reimbursement for training costs they incurred if they provided training to their workers, (Young-Sun Ra; and Soon-Hee Kang, 2012). The contributions by employers constituted a large part of the private funds used in vocational training.

Another strategy used to finance vocational training in the initial development period was through using loans sourced from international organizations like ADB and IBRD and developed countries such as Germany, Japan, U.S.A and Belgium. To attract more loans, the government of Korea implemented the matching finance strategy where facilities like land, buildings (hardware) and overhead costs were covered by the government while loans were used to build technical expertise (software) and acquisition of equipment, (Young-Sun Ra; and Soon-Hee Kang, 2012).

#### **4-1-4 Demand Driven TVET Data**

Under this priority area, the researcher sought to find out how KOPO Colleges acquire and make use of reliable information on current and emerging skills demands and the economic development priorities of the country.

Vocational training in Korea was and is heavily informed by demand driven data. For instance, when the regime of President Park launched its first 5-year Economic Development Plan, the major focus was developing light, labor-intensive and import-substitution industries like textiles and manufacturing, with the expectation that these industries will absorb the excess labor. A survey conducted on available skilled manpower in 1961 revealed that there were only 299,414 engineers, technicians and craftsmen spread in the ratio of 1:1.3:33. In order to achieve the industrial targets established in the Plan by 1966, estimates showed that the economy needed 601,763 skilled workers (see table 3) comprising of engineers, technicians, and craftsmen in the ratio 1:5:25, hence, on average, approximately 40,000 new skilled workers needed to be trained annually, (Young-Sun Ra & Soon-Hee Kang, 2012).

**Table 4:** Estimated Skills Demand During 1<sup>st</sup> 5-Year Economic Development Plan

Skill Type	1961	1962	1963	1964	1965	1966
Engineer	8,616	10,994	12,814	15,032	17,055	19,411
Technician	11,128	55,509	66,129	78,266	87,739	97,059
Craftsman	279,670	282,933	339,131	402,334	444,974	485,293
<b>Total</b>	<b>299,414</b>	<b>349,436</b>	<b>418,074</b>	<b>495,632</b>	<b>549,768</b>	<b>601,763</b>

**Source:** Sang-sun Suh (2002)

Research and Development bodies established have greatly supported the success of KOPO Colleges. KRIVET conducts research on vocational skills development policies, new jobs, industry-academic cooperation projects and teacher research support while HRD Service of

Korea undertakes research in training materials and standards, (Young-Sun Ra and Soon-Hee Kang, 2012).

## **4-2 The Process Elements in the TVET System**

### **4-2-1 Organization and Training Provision**

Under this priority area, the researcher sought to find out how KOPO colleges are organized and governed to ensure that training is effective, relevant and responsive to the standards set by the labor market.

#### **a) Ownership**

As observed by Young-Sun Ra; and Soon-Hee Kang, (2012), “public vocational training institutions in Korea were run directly by the government in their early days, but later, the responsibility for operating them was moved to public organizations or private corporations.” Basing on this wisdom, the government constructed the Joint Vocational Training Institute in 1990 using money from the Vocational Training Promotion Fund. Government wanted the private sector to take a lead role in vocational training thus transferred control of the Institute to Korea Chamber of Commerce and Industry (KCCI) in 1993. All the eight KOPO colleges spread across the thirty-four campuses in Busan, Gunsan, Gwangju, Incheon, Gyeonggi, Okcheon, Hongcheon and Gongju are public training institutions under the management of KCCI.

## **b) Role of Government and the Private Sector**

There are clearly defined roles performed by the government and the private sector and the allocation of these roles varies depending on the prevailing economic circumstances and as the country underwent different phases of development. The developmental state approach adopted by Korea meant that the government set the economic goals to be pursued by choosing heavy and chemical industries to be developed. The government then undertook an evaluation of skills needed and developed a vocational training plan to develop the skills needed. Responsibility for implementation of the plan was then shared between the government and the private sector, (Young-Sun Ra; and Soon-Hee Kang, 2012). The government also established agencies such as KRIVET and HRD Services of Korea to support in the area of research and management of vocational training.

Initially, a large portion of vocational training facilities were publicly owned. To increase the skills development capacity, the government provided financial support to the private sector in form of subsidies and other incentives to encourage them to train employees. As the economy developed and the private sector grew, the government began reducing its role. It was in this moment that the private sector took a lead role in providing training while the government playing a supervisory role, setting the policy direction and providing a conducive environment for training to thrive, (Young-Sun Ra and Kyung Woo Shim, 2009). As pointed out by Booth and Snower, (1996) who are strong proponents of the neoclassical

approach theory, firms' skill requirements are numerous and governments cannot know and provide them all hence the government should provide finance, create a conducive environment for training to flourish and let the private sector provide the training.

### **c) The Organization Structure**

The organization structure of KOPO Colleges is two-fold. First there is the KOPO Corporation that manages KOPO Colleges in the whole country and then there is the regional organization that pools campus in the same province under one Dean but each individual KOPO campus is under the management of a Dean.

#### **i) KOPO Corporation**

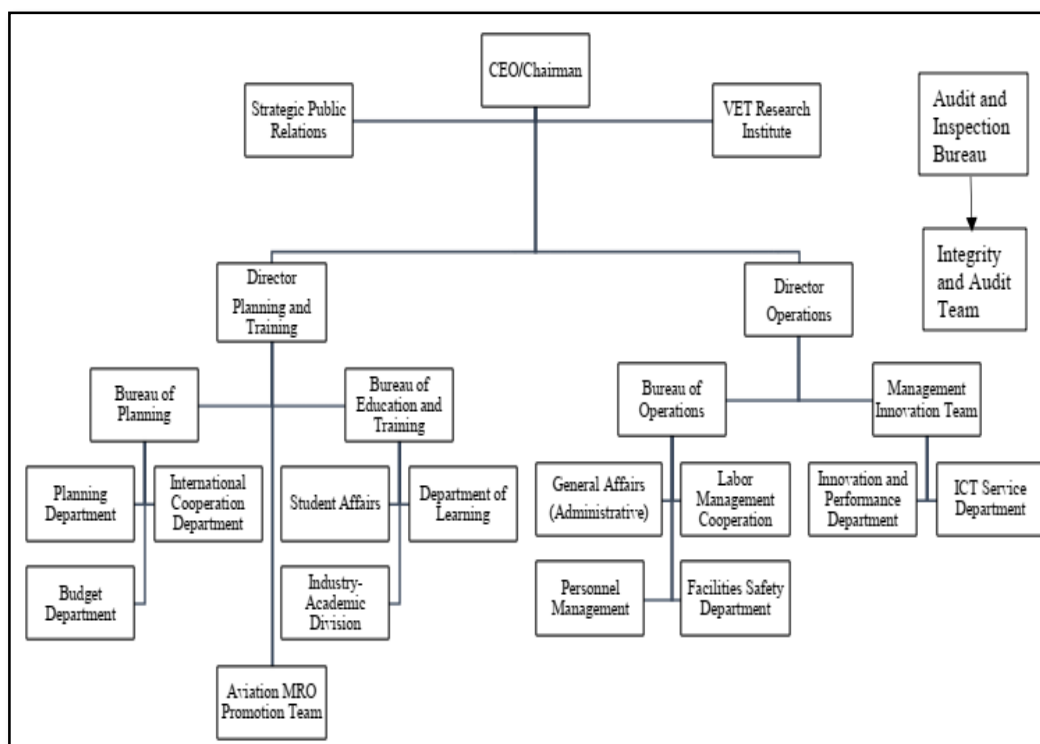
At the national level, KOPO Colleges are managed by KOPO Corporation whose organization structure is depicted (see figure 12). The Corporation is headed by a CEO Chairman who is supported by a Strategic Public Relations Manager and Vocational Education and Training (VET) Research Institute. The CEO Chairman is the head of KOPO Corporation and in-charge of overall management of the KOPO Colleges. The duty of the Strategic Public Relations office is to create and maintain positive public attitudes and mutual relations and understanding between KOPO Corporation, the colleges and the public. The role of VET Research Institute is to undertake internal and external research tasks, curriculum development, advice on equipment standards, establishment of teacher



competency system, support teacher academic research and learning, support textbook development and participate in industry-academic cooperation projects. There is an autonomous Audit and Inspection Unit whose duty is to conduct comprehensive audit and ensure compliance to public officials' code of conduct.

Below the CEO Chairman are two directors, one responsible for planning and training and the other responsible for operations. The Director Planning and Training is in charge of two bureaus, the Bureau for Planning responsible for Planning; Budgeting; and International Cooperation; and the Bureau for Education and Training responsible for Student Affairs; Industry-Academic Cooperation; and Learning. The Director Operations is also in charge of two bureaus, the Bureau for Operations responsible for General Administrative Affairs; Personnel Management; Labor Management Cooperation; and Facilities Safety and the Bureau for Management Innovation responsible for Performance and Innovations; and IT services. The Aviation MRO Promotion Team is established under Director Planning to promote cooperation with the aviation industry.

**Figure 12:** Organization Structure of KOPO Corporation



Source: Researcher Analysis from <http://www.kopo.ac.kr/en/content.do?menu=1291> (Retrieved 2020/07/05)

## ii) KOPO Campus

KOPO College/campus are headed by a Dean, who is responsible for their day to day running and management. Under the Dean, there are five bureaus (see figure 13), which are Academic Planning Division, Student Affairs, Administration, Hope Plus Centre and Industry-University Cooperation. The Academic Planning Division is responsible for public

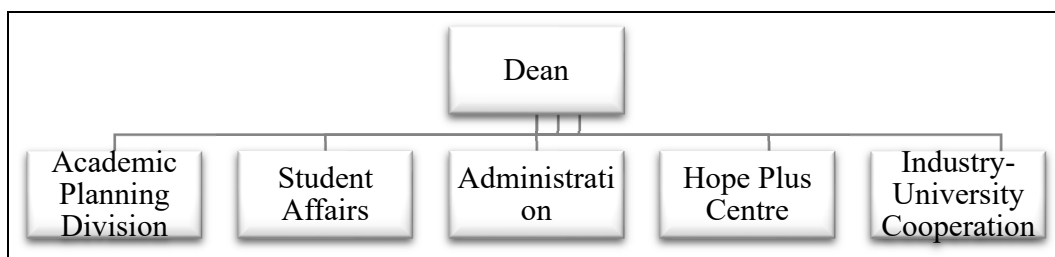
relations; enrollment and admission of students; equipment management; faculty personnel; teacher appraisal; planning, implementing and regulating academic activities; undertaking evaluation on research, performance and operation; and administering tests and examination.

The Student Affairs Department is responsible for student support activities like scholarship and loans, student character education (personality dedicated teacher like Incheon Campus); student life and career counselling; students clubs' support; promoting student welfare; alumni associations; employment support. The Administration Department is responsible for general administrative functions including planning, budgeting and accounting; facility construction; emergency, safety and security; purchase of practical materials, other education and training equipment; asset use; restaurant operations; and Human Resource management services like remuneration, reporting and recruitment.

The Hope Plus Centre is responsible for training that targets vulnerable groups in the society running programs like women training; baby boomer training; training for employment improvement; re-employment training for middle-aged; support for small-business training among others. The Industry-University Cooperation department is responsible for promoting cooperation and partnerships between the training institutions, industry and businesses through the Corporate dedicated system that champions On Job Training (OJT); Dual Joint Training (DJT); Work Training; Business Incubation; and Regional and Industrial Customized Human Resource Development Project for training and retraining of workers

for the industries within the region. One striking aspect of KOPO Colleges is the impact of these two bureaus which perhaps helps explain the high employment rate and positive public rating.

**Figure 13:** Organization Structure of KOPO Campus



**Source:** Researcher Analysis from <http://www.kopo.ac.kr/en/content.do?menu=1292>  
(Retrieved 2020/07/05)

#### **d) Training Provision**

KOPO Colleges were established mainly to cultivate industrial workforce (technicians, craftsmen, and master-craftsmen) that majorly focuses on field and practical work. The craftsmen training program lasts one-year and provides trainees with 1,400 hours of classes per year comprising of 140 hours of general theory, 280 hours of theory in a specialized field and 980 hours of practice in the specialized field. The technician training program lasts two years and develops multi-skilled engineers in key national industries and other industries where private training institutions aren't able to offer the training.

The training curricula requires trainees to undertake a 40:60 theory-practice component and have a total of 108 credits to graduate.” Eligibility for the technicians training is a high school graduates or those with equivalent academic qualifications and upon completion, receive a Bachelor of Industry degree, similar to the Bachelor’s degree in junior colleges. Those eligible to enroll for the craftsmen training are non-college-bound youth, unemployed and women; and those with no academic qualifications. The trainees are issued with a certificate upon completion, (Chae, Chang Kyun and Jaeho Chung, 2009).

#### **4-2-2 Coordination and Partnerships**

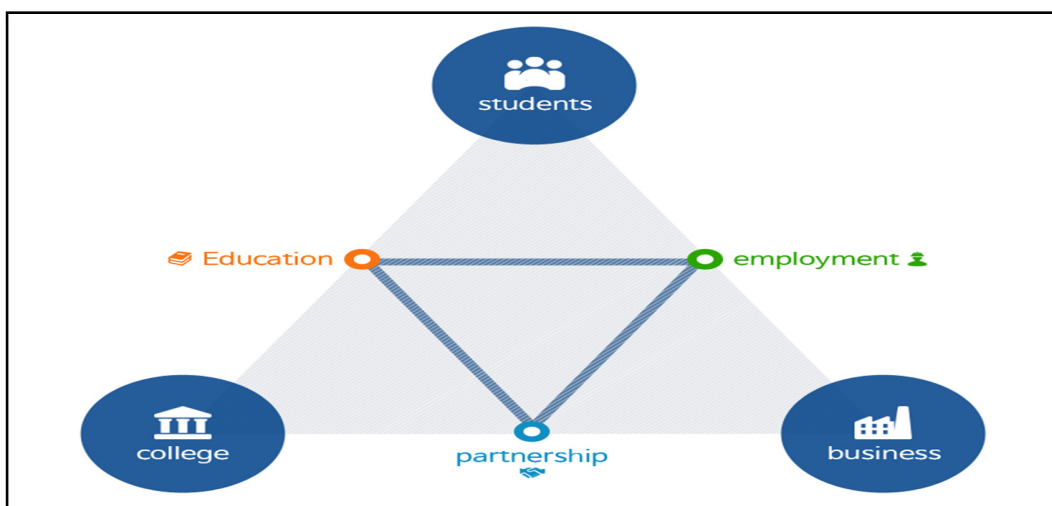
Under this priority area, the researcher sought to analyze the partnerships that exist between KOPO Colleges, other learning institutions, government and non-government stakeholders including industry experts, employers, private sector among others.

KOPO Colleges run a dedicated bureau called Industry-Academic Division whose major task is to promote industry-academia cooperation by initiating partnerships between training institutions, the industry and businesses through the Dedicated Corporate Operation System (see figure 14) which is cooperation between KOPO Campus, trainees and industry. KOPO Colleges provide a field-oriented education and training system that is suited to the needs of the local industry based on a project called ‘KOPO Project System’ whose components are FL (Factory Learning), WL (Work Learning) and RL (Restart Learning). Within this system,

learning and training curricula combines technical training with humanities education to produce an all-round graduate.

The Corporate dedicated system is a unique academic operation system that seeks to enhance company and college competitiveness through close industry-academia cooperation in areas such as technology trend analysis, field practice, on-the-job training and job ability improvement training which has benefited over 130,000 companies and seen most students employed by the companies. Through this bureau, the campus also runs a project called regional and industrial customized human resource development project for training and retraining of workers for the industries within the region.

**Figure 14:** An illustration of the KOPO Dedicated Corporate Operation System



Source: <http://www.kopo.ac.kr/en/content.do?menu=1308> (Retrieved, 2020/09/21)

### 4-2-3 Access and Participation

Under this priority area, the researcher sought to find out how KOPO Colleges provide training programs and assess how the programs promote equity and inclusion, especially of disadvantaged groups.

KOPO Colleges offer a range of courses spanning from two-year degree programs to one-year non-degree professional courses and short-term unemployment and incumbent (business improvement) courses (see table 4). The degree courses include the Industrial Associate's Degree which aims to train technicians and engineers and equip them with knowledge and skills for two or more vocations and make them capable of functioning throughout the process of production from development of a good to manufacture. Another degree course is the Intensive Major Course (night) that involves Work-to-School programs for the retraining of degree-oriented education of people with vocational college diplomas and work experiences. The non-degree courses include Master Technician Course which lasts one to two years and targets professional technicians with craftsman training. The course enables them to work in management positions and supervise other technicians.

**Table 5:** KOPO Colleges 2016 Education Training Enrolment

Classification	Program Name	Number
Factory Learning (FL)	Multifunctional Technicians	16,010
	Craftsman	7,400
	Master Technician	325
	Advanced Major	500

	Dasomi School	135
Work Learning (WL)	Employed Improvement	52,000
Restart Learning (RL)	Vulnerable Groups	3,000
	General High School	1,000
<b>Total</b>		<b>80,370</b>

Source: <http://www.kopo.ac.kr/en/content.do?menu=1303> (accessed on 2020/09/21)

The Department of Hope Plus Centre established under the Dean of each KOPO Campus promotes training that targets vulnerable groups i.e women, redundant workers, youth and uneducated. From the courses provided by KOPO Colleges, two programs that targets developing vocational skills of this group, alongside small businesses were identified. The Craftsman courses are state-sponsored vocational training programs in construction works and architecture, printing, publishing and design, electronics, hotel management, textile and fashion, automobile, IT that targets unemployed job seekers aged 15 and above with no educational backgrounds. The entire training cost is paid for by the government and in addition, trainees receive KRW 200,000 and KRW 50,000 as training and transportation allowance respectively and upon completion, the graduates are provided with job search assistance and post-program training. The Women Re-employment Course targets female workers who can be immediately put into small and medium-sized business while the Middle-aged Re-employment Course targets middle-aged people to expand their vocational skills. KOPO colleges also offer business improvement courses suitable for regional characteristics.



#### **4-2-4 Monitoring, Evaluation and Feedback**

Under this priority area, the researcher sought to find out how KOPO Colleges make use of evaluation and feedback techniques to improve performance and achieve expected outcomes.

Monitoring, evaluation and feedback have greatly supported the success of KOPO Colleges with the feedback provided being very crucial in developing and evaluating policies and effectiveness of training. Evaluation of KOPO colleges takes place in different aspects, within the organization structure, the Integrity Audit Department undertakes a comprehensive annual audit of KOPO Colleges and ensures the enforcement of the Public Officials' Code of Conduct (<http://www.kopo.ac.kr/content.do?menu=1166>, retrieved 2020/09/21). The administration is responsible for reporting of administrative data like enrollments, staffing, budgetary expenditure which serves to improve accountability, (KRIVET, 2007). The launch of the “Training Institution and Course Evaluation Project,” has ensured that evaluation of institutions and courses is conducted annually in order to control quality of training programs which has resulted in improved competitiveness and elimination of poorly-performing institutions and courses every year, (Young-Sun Ra; and Soon-Hee Kang, 2012).

#### **5. Testing of Hypothesis and Conclusion**

The hypothesis of the study is: An effective TVET system requires policies that strengthen governance, priorities that are aligned to national development objectives and modern facilities and equipment that implement training with efficient feedback mechanisms. Through the findings of the study, it's clear that several factors were synergized and clearly coordinated to ensure that the training provided by KOPO Colleges was effective.

To ensure that the vocational training was anchored in law, a legal framework was developed and varied as the situation necessitated. Vocational training was also made a crucial component of the national development objective expressed through the five-year national development plans. Industry demand driven skills formed the main basis of the training provided and other elements constituting an effective skills development system were put in place to ensure that all the citizens acquire appropriate and relevant training for gainful employment.

Thus, the hypothesis that an effective TVET system requires policies that strengthen governance, priorities that are aligned to national development objectives and modern facilities and equipment that implement training with efficient feedback mechanisms is thus proven to be true.

## **CHAPTER V: CONCLUSION AND POLICY RECOMMENDATIONS**

### **1. Introduction**

The chapter elaborates the education system in Kenya to enhance the understanding of the position of vocational education and training and gives a detailed analysis of youth polytechnics in Kakamega county. It further provides a summary of findings from the study and makes policy recommendations for establishing an effective youth training system and suggests areas of further research.

### **2. Implications for TVET in Kenya and Youth Polytechnics in Kakamega County**

#### **2-1 The Basic Education System in Kenya**

Kenya has been implementing an education system since 1985 that is structured in 8-4-4 model with eight (8) years primary education, four (4) years secondary education and four (4) years university education in undergraduate programs, (Amutabi, 2003). In this system, formal and compulsory primary schooling starts at the age of six through age 14. On completion, learners sit for Kenya Certificate of Primary Education (KCPE) examination. The examination is used to enroll students into secondary schools based on performance. The secondary schools lasts four years and on completion, students sit for Kenya Certificate

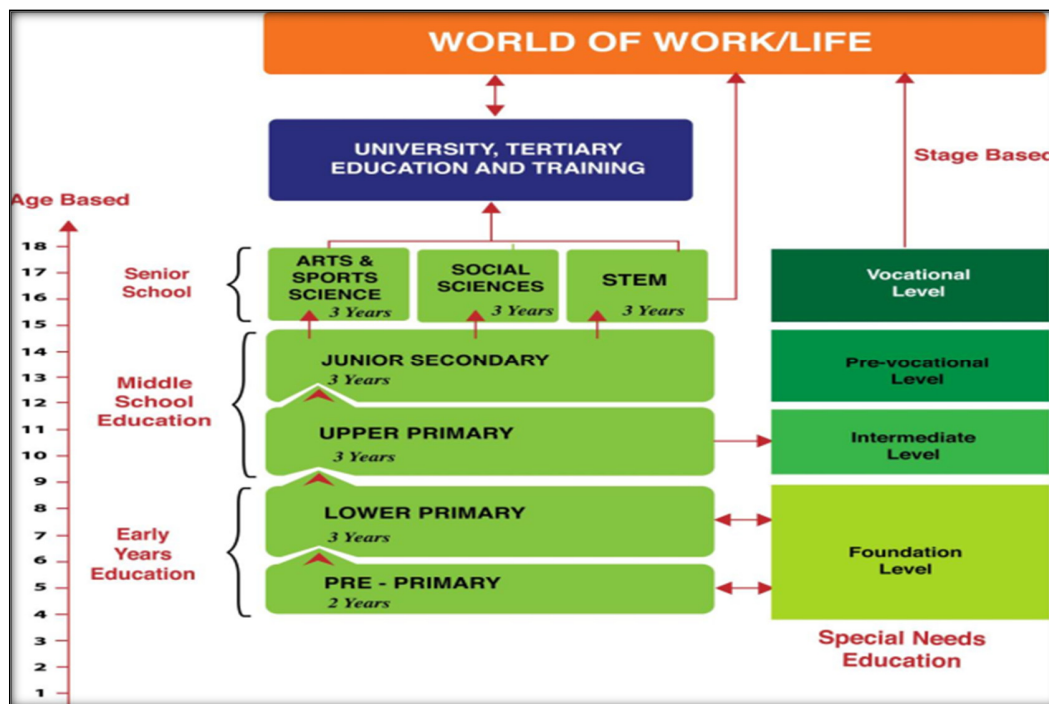
of Secondary Education (KCSE) examination. Both KCPE and KCSE examinations are administered and managed by Kenya National Education Council (KNEC), (Republic of Kenya, 2017). Performance in the secondary school examination is used to enroll students into universities, junior colleges and TVET institutions. Holders of KCPE certificates not able to enroll in secondary schools and holders of KCSE certificate not able to enroll in these institutions attend youth polytechnics.

Following the promulgation of the new constitution in 2010, a Task Force was established to re-align the education sector to the new constitution and the country's long-term plan – Vision 2030, (Republic of Kenya, 2008) and based on the Task Force Report, the government developed a Sessional Paper on that recommended reforming the Education and Training Sector, (Republic of Kenya, 2012a; 2012b). The 8-4-4 system was viewed as being examination oriented, emphasizing coverage of syllabus content and having no concern for skills development where students who completed the system had little acquisition of critical skills, soft skills and values as required by Chapter 6 of the Constitution, (Republic of Kenya, 2016). In response, the New Competency Based Education and Training (CBET) Curriculum that emphasizes development of skills, knowledge and their application to real life situations was developed, (Republic of Kenya, 2017).

Implementation of the new curriculum was piloted between May 2016 to December 2018 and a full roll out executed in January, 2019. In this curriculum, basic education is based on

2-6-3-3 model categorized into three (3) levels. The Early Years Education (level 1) comprising of two years of pre-primary and three years of lower primary; the Middle School education (level 2) comprising of three years of upper primary and three years of junior secondary; while the Senior School education (level 3) comprising of three years of senior secondary. Learners in senior secondary focus on a field of their choice to further their education and/or gain employable skills. Upon completing this level, learners may pursue studies in; Arts and Sports Science; Social Sciences; or Science Technology Engineering and Mathematics (STEM), (Republic of Kenya, 2012c; 2017). The basic education system in Kenya is presented below (see figure 15).

**Figure 15:** The Basic Education System in Kenya



Source: KICD Basic Education Curriculum Framework, 2017

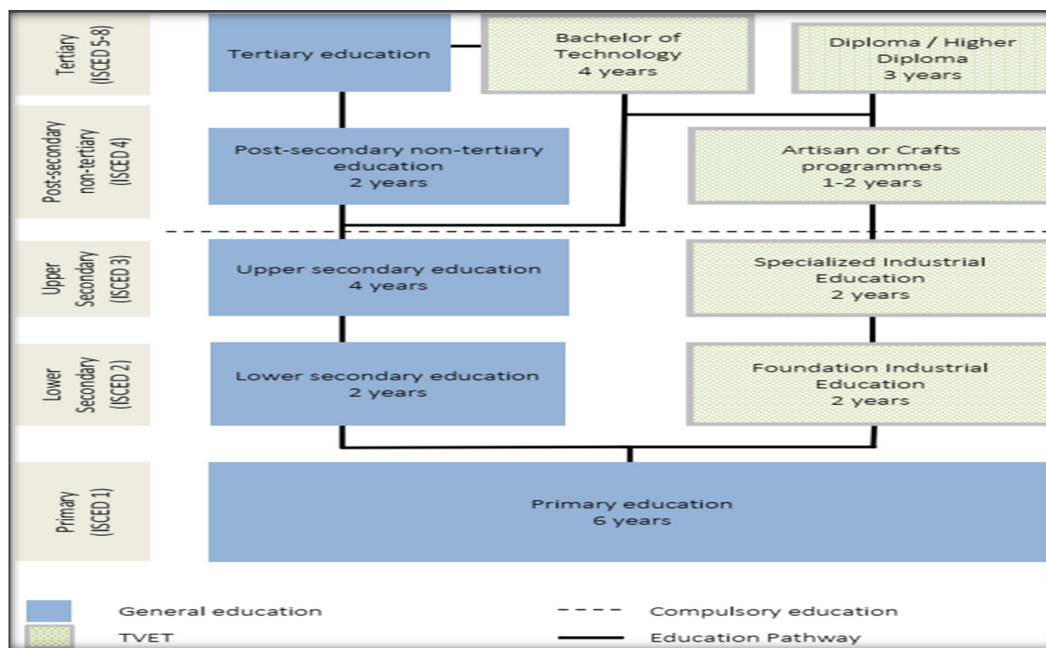
## 2-2 The Vocational Training System in Kenya

Vocational education and training have been in existence in Kenya since time immemorial. Traditionally, people constructed their own houses, made items such as pottery, axe, hoe, spears, knives among others using arts and skills that were acquired and passed on from parents to offspring within the family or clan through an apprenticeship system, (John W. Simiyu, 2009; Okaka, 2001). Formal vocational training commenced in the early 20<sup>th</sup>

century with the coming of the Europeans and Indian technicians who constructed the Kenya-Uganda railway. Upon independence and subsequent periods, development of sophisticated equipment and machinery presented a greater need for training in many skills such as drivers, motor mechanics, builders, electricians, welders, carpenters among others, (John W. Simiyu, 2009).

A Commission for Higher Education established in 1954 recommended the establishment of the Royal Technical College in Nairobi, the present-day University of Nairobi to offer technical training. The Mombasa Institute of Muslim Education which was in existence was converted into Mombasa Technical Institute and later Mombasa Polytechnic in 1972. The Kenya Polytechnic was established in 1961 to provide basic craft courses, and in the periods that followed, several industrial depots were upgraded to vocational schools and secondary vocational schools. After independence, much emphasis was placed on mainstream academic institutions – primary and secondary schools, universities and colleges. As a result, the quality of training deteriorated and TVET institutions became second class institutions to the mainstream academic institutions reserved for those who failed from the school system and dropouts. It was not until 2005 with the creation of the Ministry of Youth Affairs and Sports that focus again shifted to TVET institutions, (John W. Simiyu, 2009). The TVET system in the Kenyan education system is presented (see figure 16) as elaborated by UNESCO, (UNESCO-UNEVOC, 2018a).

**Figure 16: TVET in the Kenyan education system**



**Source:** UNESCO-UNEVOC TVET Kenya Country Profile, 2018

**Foundation Industrial Education** is a two-year course offered to students who have sat for KCPE examination and is taught in industrial secondary schools under the State Department of Basic Education;

**Specialized Industrial Education** is a two-year course offered to graduates of lower secondary education who have passed the examination for the Foundation Industrial Education. Graduates of the course can seek work or advance to further education at the post-secondary non-tertiary level;

**Artisan and craft** are one and two-year courses offered in National Polytechnics and Technical Universities to students who attain a higher mark than D- for Artisan and D+ for Craft in KSCE examination;

**Diploma, Higher Diploma, and Bachelors of Technology** are three-year diploma and four-year bachelor programmes offered in National Polytechnics and Technical Universities to



students who attain a higher mark than C+ for Diploma or Higher Diploma, and B+ for Bachelors in KCSE examination.

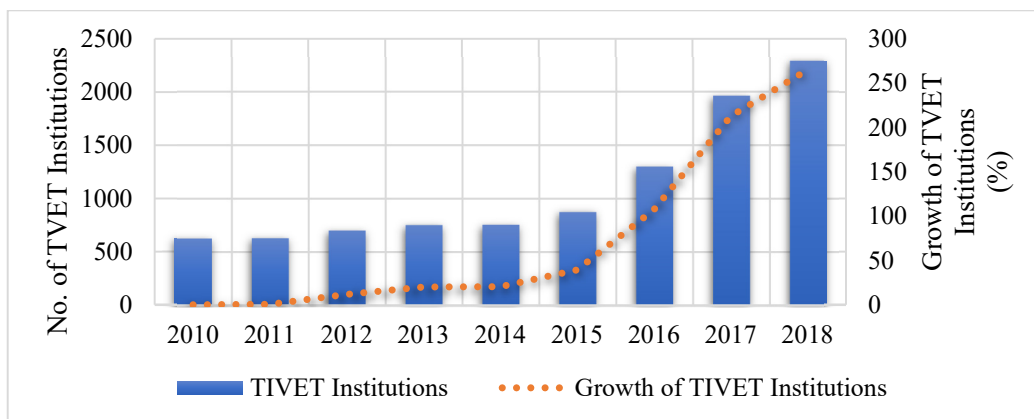
**Grading** in the Kenyan Basic Education System is based on a numeric 12-point scale from 1-12 and an expanded letter grade ranging from A to E (A, A-, B+, B, B-, C+, C, C-, D+, D, D-, E).

### **2-3 TVET Institutions in Kenya**

There are varied TVET institutions in Kenya including; those providing informal training in the informal sector (Jua Kali); National Industrial Vocational Training Centres (NIVTCs) which undertake government pre-service and in-service training of personnel working in technical fields; Youth polytechnics (formerly Village Polytechnics) which offer artisan training courses (Government Trade Tests) for uneducated, primary and secondary school-leavers or school dropouts; Technical Training Institutes and Institutes of Technology which offer craft and diploma courses to secondary school graduates and National Polytechnics which offer diploma courses that can enable one enroll into university, (John W. Simiyu, 2009).

According to KNBS Annual Statistical Abstract for the year 2019, (Republic of Kenya, 2019a; 2018b), TVET institutions have increased by more than 260 % from 627 in 2010 to 2,289 by the year 2018 (see figure 17). This growth is attributed to the government policy focus of promoting technical and vocational education and increased budgetary allocation.

**Figure 17: TVET Institutions in Kenya (2010 – 2018)**



**Source:** KNBS Statistical Abstract, 2019

## **2-4 The Case of Youth Polytechnics in Kakamega County**

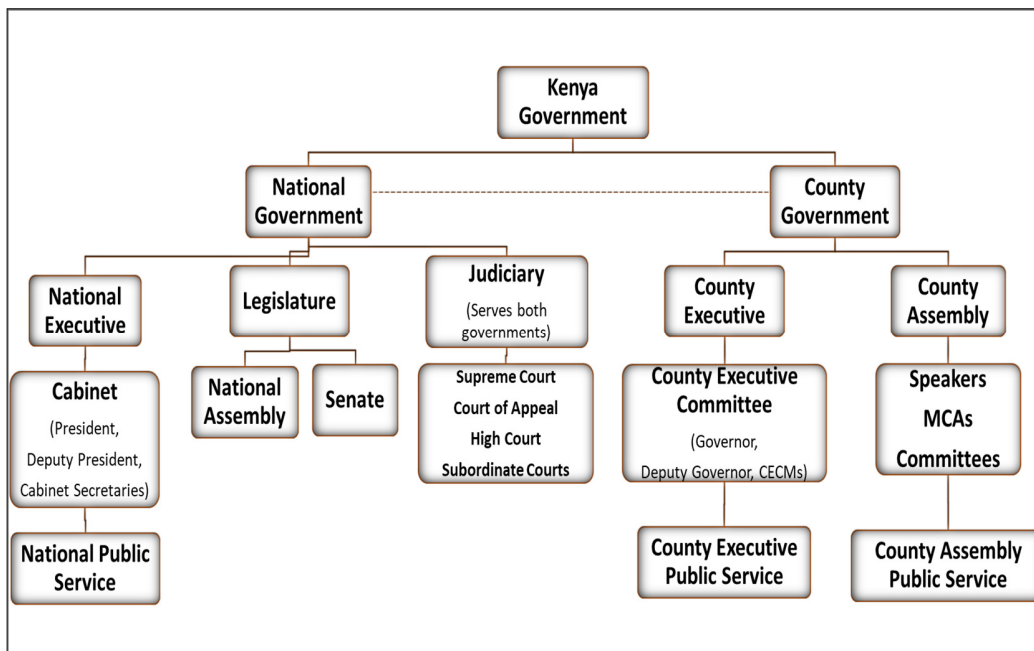
### **2-4-1 The Birth of Regional Governments in Kenya**

Kenya adopted a new constitution in 2010 whose major milestone was the changing of the governance structure adopted at independence from a centralized system to a decentralized system comprising of the national government and forty-seven (47) county governments, each with specific delegated functions and powers (see figure 18). As per the fourth schedule, decentralized units were delegated fourteen (14) functions while the national government delegated thirty-five (35) functions, (Republic of Kenya, 2010). The changed governance landscape allocated the responsibility for development of education and training to both the national government (Education Policy, Standards, Curricula, National Examinations,

Granting of University Charters, Universities, Tertiary Educational Institutions and other Institutions of Research and Higher Learning, Primary Schools, Special Education, Secondary Schools and Special Education Institutions) and the regional governments (Village Polytechnics, Homecraft Centers and Farmers Training Centers and other institutions that train operators in vocational trades and skills), (Republic of Kenya, 2010; County Government of Kakamega, 2018).

This study postulates that as much as the study area is confined to youth polytechnics in Kakamega County, the findings and recommendations will be beneficial and applicable to all county governments as they share almost similar experiences and share similar aspirations in developing an effective vocational education and training system.

**Figure 18:** The Governance Structure of the Republic of Kenya



**Source:** Author construction from the Constitution of Kenya, (2010) and The County Governments Act, (2012)

## 2-4-2 From Village Polytechnics to Youth Polytechnics

Village Polytechnics in Kenya were established after a conference organized by the National Council of Churches of Kenya (NCCK) in 1966 whose theme was; ‘After School What?’. The polytechnics were referred to as ‘Village Polytechnics’ because most were located in rural areas where they were expected to provide employable skills to school drop-outs.

However, the village polytechnics performed poorly, producing graduates with inadequate technical and entrepreneurial skills required by the labor market and as a result, they lost credibility in the society, regarding them as inferior institutions reserved for school failures and drop-outs, (John W. Simiyu, 2009; 2010).

In 2005, the government created the Ministry of Youth Affairs and Sports which began to promote vocational training in the village polytechnics and improving their competitiveness. Subsequently, the ministry renamed the ‘village polytechnics’ as ‘Youth Polytechnics’, a decision that was expected to give the institutions a national outlook as opposed to the local village outlook and also change the negative perception by the public. Since then, several initiatives promoting Youth Polytechnics have been undertaken, including infrastructure expansion, improving learning equipment, coordinating curriculum development and implementation, employing professional instructors and quality assurance on programs, (John W. Simiyu, 2009; 2010).

### **2-4-3 Youth Polytechnics in Kakamega County**

Kakamega County is located in the Western part of Kenya (see figure 19) and is one of the 47 counties established by the constitution. The first County government was formed in 2013 following the general elections held in March of the same year. Data from the County Government Department of Training indicates that there are 66 Youth Polytechnics of which

62 are publicly owned while 4 are privately owned. The youth polytechnics offers training at two levels – the artisan level and the government grade test which is on-job-training. Some selected polytechnics (Kabras and Matungu) also offer Agricultural Technical Vocational Education Training (ATVET) program that is funded by the Germany International Cooperation Agency (GIZ). The ATVET program is a modularized program where each module lasts six months consisting of four months coursework and two months field work covering the following courses; Horticulture, Aqua-culture, Dairy-production and Agri-preneurship. The total trainee enrolment in the regular program as of 2017 was 6,966 where 52 percent are female while 48 percent male, (County Government of Kakamega, 2018) while ATVET Program, as of 2019 had enrolled 520 trainees, (County Government of Kakamega, 2020).

**Figure 19:** Map of Kenya Showing Location of Kakamega County



**Source:** Google Maps, 2020

Since 2013, Kakamega County has rolled out a number of programs aimed at transforming and promoting vocational training including enactment of a County Polytechnics Act in 2014, construction and equipping of learning and practice halls, expansion of land acreage, provision of tuition subsidy through the capitation program, recruiting additional instructors

and rebranding of the polytechnics and enhancing the relevance of programs taught through collaborations (County Government of Kakamega, 2018).

#### **2-4-4 Analyzing the Youth Polytechnics Using the Conceptual Framework**

##### **a) Analysis of the Input Elements in the TVET System**

The input elements identified in the conceptual framework are policy and advocacy; quality and standards; financing TVET; and demand-driven TVET data.

##### **i) Policy and Advocacy**

Policy and advocacy are important foundations that an effective training system is built on. Support by political leaders, private sector and CSOs is important for training to be effective. In Kakamega County, advocacy for training by the County leadership is evidenced by the objective expressed in the CIDP of promoting access to equity, quality and relevant training, (County Government of Kakamega, 2018). To ensure that training is implemented on a sound legal framework, the County government enacted the County Polytechnics Act in 2014, (County Government of Kakamega, 2014).



## **ii) Quality and Standards**

The youth polytechnics lacks adequate training facilities like equipped libraries, ICT infrastructure, classrooms, practice halls, equipment for practical learning and instructional materials which are fundamental to the provision of high-quality training. The County does not have a qualifications framework for the programs taught in the youth polytechnics and relies on the framework in use at the national level. The County has not established a body responsible for the development and ensuring quality of curricula, the management of the polytechnics are responsible for the development of their own curricula. There are no linkages with other educational institutions which implies that transfer of a trainee from youth polytechnic to other vocational or academic institutions becomes a challenge especially for trainees who wish to pursue further higher education.

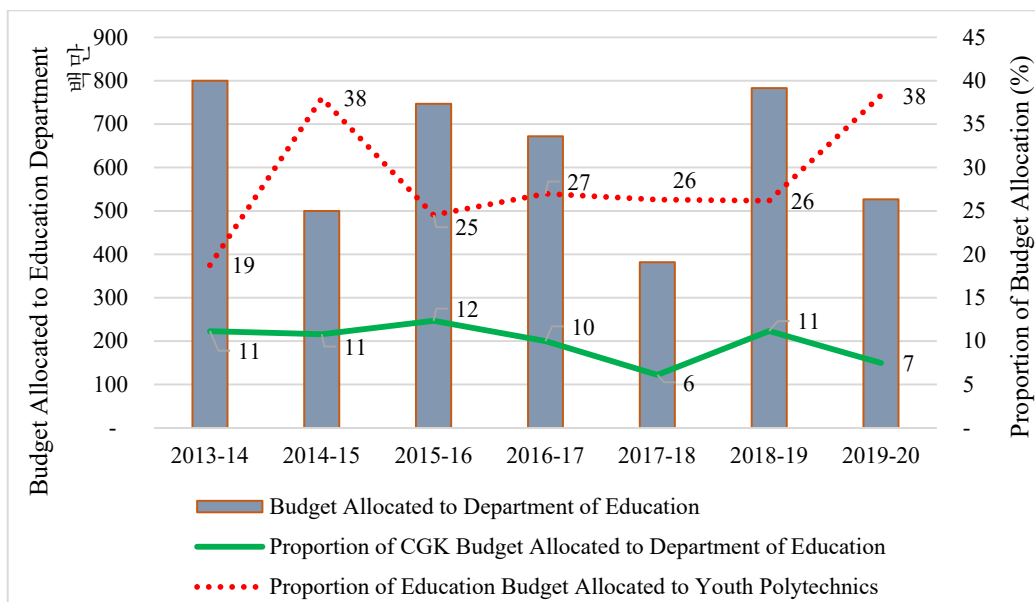
The courses offered in the County Youth Polytechnics are Building and Construction Technology; Carpentry and Joinery; Metal Processing Technology; Food Processing Technology; Agribusiness Technology; Motor Vehicle Technology; Electrical and Electronic Technology; Hair Dressing and Beauty Therapy; Refrigeration and Air Conditioning; Information Communication Technology; Garment Making and Fashion Design, (County Government of Kakamega, 2018; 2020).

### **iii) Financing TVET**

The youth polytechnics are fully funded by the County Treasury through the monies appropriated by the County Assembly, conditional grants from the national government and support from development partners. The funding from the County government is based on a capitation program where each student enrolled is allocated KES 15,000 annually (about USD 150) and is used to cater for day today running of the polytechnics, pay utility bills and wages for instructors directly employed by the polytechnics. Other funding are conditional grants received from the national government for development of infrastructure and acquisition of equipment and funding for ATVET program provided by development partners, (County Government of Kakamega, 2018; 2020).

An analysis of the various county fiscal strategy papers prepared since financial year 2013/14 to 2018/19 and the budget estimates approved by the County Assembly for the same period reveals that on average, at least 10% of the total County budget (See figure 20) was allocated to the department of Education and at least on average, 25% of this funding was allocated to Youth Polytechnics, (County Fiscal Strategy Papers for Financial Years 2013/14 – 2018/19).

**Figure 20:** Analysis of Budgetary Allocation to Youth Polytechnics



**Source:** Researcher Analysis from Kakamega County Fiscal Strategy Papers (2013/14 – 2018/19)

#### iv) Demand Driven Training Data

Kenya as a country lacks a skill audit system and skills inventory to provide information on the labor market needs, as a result, training is undertaken without paying attention to relevance to the labor market needs resulting in a mismatch between skills demand and skills available. The available data with the youth polytechnics is limited to enrolment, completion rates and nothing more on industry workforce requirements. As observed by Susan Ngunjiri (2018), there is a discrepancy between the skills TVET institutions offer to their trainees and

the requirements of the labor market and thus most causes of failure of the TVET institutions has been alluded to the system's failure to respond to the needs of the industry.

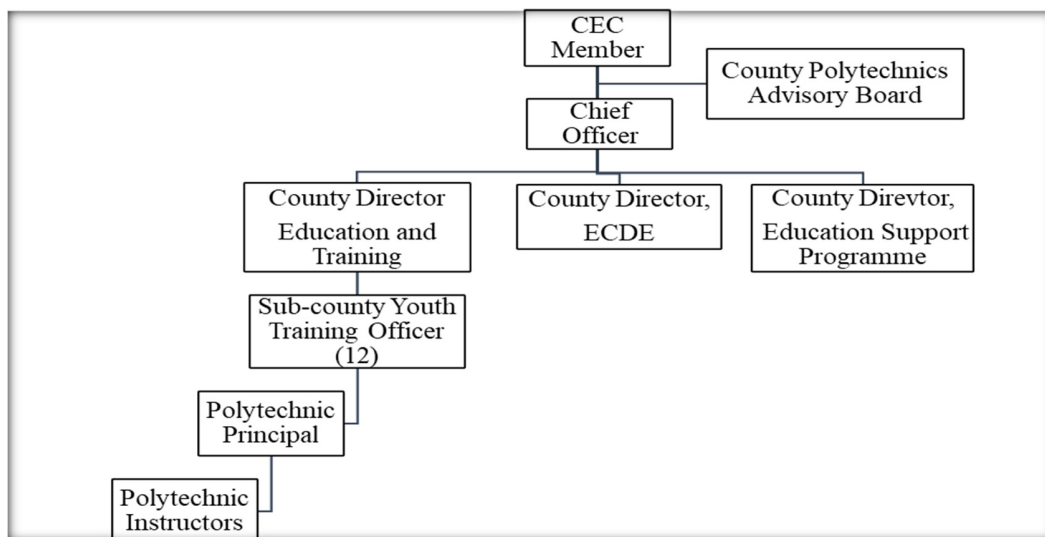
## **b) Analysis of the Process Elements in the TVET System**

The process elements identified in the conceptual framework are Organization and Training Provision; coordination and partnerships; access and participation; and M & E and feedback.

### **i) Organization and Training Provision**

The organization structure of youth polytechnics is elaborated below (see figure 21). At the County level, the polytechnics are headed by the County Executive Committee (CEC) Member responsible for the Department of Education, Science and Technology and supported by a County Polytechnics Advisory Board (CPAB) established pursuant to the provisions of Kakamega County Polytechnics Act, 2014. The CEC Member is the head of the department and is responsible for overall policy and management of the polytechnics. The role of CPAB is to advise the CEC Member on efficient management of the polytechnics. The Chief Officer is the accounting officer of the department and is responsible for day to day operations. The County Director Education and Training oversees the overall working of the polytechnics at the County level assisted by Sub-county Youth training officers stationed in each of the twelve (12) sub-counties, (County Government of Kakamega, 2014).

**Figure 21:** Organization Structure of Youth Polytechnics in Kakamega County



**Source:** Researcher Analysis from County Government of Kakamega, 2014

The day to day running of the polytechnics is overseen by a County Polytechnic Board of Management (BOM) where the polytechnic principal, on behalf of the board, is responsible for management of each polytechnic performing such tasks as admissions, staff supervision, equipment management, budgeting and accounting, purchase of education and training equipment and asset use. The Principal, Deputy Principal, and heads of academic departments make up an Academic Board that is responsible for determining criteria for admission of students, development of academic activities, content of curricula, academic standards, validating and reviewing courses, procedure of assessing trainees, procedure for award of qualifications and honorary academic titles and establishment of links with

different industries and businesses. The polytechnic instructors implement the learning programs and are responsible for planning, implementing learning activities; undertaking evaluation and administering tests.

The Principal, deputy principal and teaching staff are appointed through a competitive process by the County Public Service Board, (County Government of Kakamega, 2014). As of 2017, the staff establishments in the polytechnics comprised of two categories, those employed on permanent terms and those contracted under BOM terms. As of 2017, the total number of staff was 371 staff (See appendix 2) of which 126 were permanently employed while the rest were contracted under BOM terms, (County Government of Kakamega, 2018). The qualification for employment as an instructor is a Diploma or Craft Certificate (ISCED 5) which is awarded in pre-service training offered in Technical Teacher Training Colleges that takes two years and is managed by the Ministry of Education.

## **ii) Coordination and Partnerships**

There are weak industry linkages and low participation of private sector in overall working of the polytechnics. There is noted a cooperation agreement with German Organization (GIZ) for the development of Agriculture Technical and Vocational Education and Training (ATVET) Programs that promote Agribusiness in the county, (County Government of Kakamega, 2018; 2020). Besides this, there are no other cooperation agreements with

specific industries, other training institutions or institutions of higher learning or other agencies.

### **iii) Access and Participation**

TVET institutions in Kenya are perceived as being inferior to general academic institutions, a practice that can be traced back to the discriminative approach used by the colonial administration which reserved academic education for ‘whites’ and the sons of chiefs who supported their administration while Africans were placed in vocational institutions to supply cheap manual labor, (John W. Simiyu, 2009). The negative attitude implies intelligent learners pursue university education and other formal vocational training rather than join polytechnics which are left to those who are deemed failures from mainstream academic institutions. The result is that there is low advocacy of vocational training, which has affected budgetary allocation leading to inadequacy of physical facilities for training, insufficient modern equipment and tools, understaffing among other issues that has made vocational training unattractive. Within Kakamega county, the government has tried to enhance participation in training by the youth, women and other disadvantaged groups through provision of tuition subsidy implemented through the capitation program where the trainees in the polytechnics do not pay training fee, with all tuition fees being paid by the county government.

#### iv) Monitoring, Evaluation and Feedback

Monitoring and Evaluation is undertaken by the directorate of education and training to ensure standards from which the curriculum is implemented are adhered to, the relevance of the training and prudent use of allocated resources. The major challenge is that there are no mechanisms through which feedback from the evaluations is shared with stakeholders, industry players among others and the quality of the evaluation reports is also in question.

### 3. A Comparative Analysis of KOPO Colleges and Youth Polytechnics

The table presents a comparative analysis of the key elements of the study as implemented by KOPO Colleges and Youth polytechnics.

**Table 6:** A Comparative Analysis of KOPO Colleges and Youth Polytechnics

S. No	Element	KOPO Colleges	Youth Polytechnics
1.	Policy and Advocacy	<ul style="list-style-type: none"><li>* Training priority aligned to national economic development priority;</li><li>* Training supported by national and business leaders;</li><li>* Developed legal framework to support training;</li></ul>	<ul style="list-style-type: none"><li>* Training priorities not aligned to economic development priorities;</li><li>* County Polytechnics Act developed to support training;</li></ul>
2.	Quality and Standards	<ul style="list-style-type: none"><li>* Certification system based on National Competency Standards and National Technical Qualification Framework;</li><li>* Developed education pathways for trainees lifelong learning</li></ul>	<ul style="list-style-type: none"><li>* Certification system based on Government Trade Tests developed by National Industrial Training Authority (NITA) and undertaken by KNEC;</li><li>* No education pathways exist</li></ul>



S. No	Element	KOPO Colleges	Youth Polytechnics
3.	Financing TVET	* Training financed by public funds, private funds (training levy); funds of private institutions; tuition payment by trainees and contributions from donors.	* Training only financed by public funds from Country treasury
4.	Demand Driven TVET Data	* Training priorities informed by data on labor market needs;	* Training priorities not informed by data on labor market situation
5.	Organization and Training Provision	* Government plays a supervisory role, (set policy direction and accreditation); * Private sector provides training;	* Government plays both supervisory role and provides training; * No private sector involvement
6.	Coordination and Partnerships	* Partnerships established to promote cooperation between campus, trainees and industry;	* No partnerships or coordination exist with private sector; * ATVET Program supported by GIZ;
7.	Access and Participation	* Established mechanisms to support access to training by vulnerable groups and small businesses.	* Pays tuition fees for all trainees
8.	M & E and Feedback	* Evaluation of institutions and courses conducted annually;	* No mechanism of undertaking evaluation of institutions and courses; * No mechanisms of sharing feedback

**Source:** Researcher Analysis

#### 4. Summary of findings

Numerous studies done in the past have elaborated the important role played by vocational training in an economy i.e creating a skilled workforce. A skilled workforce is employable, enhance innovation, improve productivity and in the process attract foreign direct

investment. A skilled workforce also has positive attributes to the society where it enhances social integration as the poor get employable skills, get employed and increase their incomes.

The study has shown that the vocational training in Korea was well organized and adequately planned to ensure that citizens acquired relevant skills applicable to the stage of development the country was going through and also relevant to industry needs. The vocational training increased available skilled workers from 508,000 in 1965 to over 5 million by the year 1995. Since 1967 when the first Vocational Training Act was enacted and established a formal Vocational training framework, the TVET system has gone through many changes occasioned by the technological shift, where industries changed production techniques from labor-intensive to technology-intensive. The current development phase of Korea has shifted the demand of skills to high-tech industries where engineers and scientists have taken the place of skilled workers and thereby reduced the relevance of traditional vocational training.

Establishment of Korea Polytechnics (KOPO) colleges strengthened vocational training, producing a new set of skills acquired through a close industry–academia cooperation, with programs tailored to the needs of corporate partners. Most graduates of KOPO colleges are employed through the dedicated corporate operation system where employment rates of over 85% have been registered.

## **5. Recommendations for Enhancing Performance of the Youth Polytechnics**

The study makes the following recommendations, based on the thematic areas, to Kakamega county for establishing an effective training system;

### **5-1 Policy and Advocacy**

The role policy and advocacy play in creating a conducive environment for training to be effective cannot be overemphasized. In view of this, the study recommends;

- i) Though it is not possible to transfer the Korean TVET system to Kenya, there can be some policy borrowing, (Matthias Pilz, 2016) that recognizes the socio-economic characteristics of Kenya, the local vocational training structures and the labor market conditions;
- ii) Aligning the training priorities to economic development priorities of the county and country (World Bank, 2015);
- iii) The government to recognize training as an investment, not a cost, with returns like enhanced productivity, improved competitiveness, social cohesion and economic growth;
- iv) Promote good management of Youth polytechnics and employ qualified teaching personnel and administrative staff with good working conditions.
- v) Undertake public advocacy campaigns to change the mindset of parents, community and employers about quality of training provided by Youth polytechnics while improving the social status of trainees through promoting their employability, better

wages and developing public confidence in the qualifications of polytechnic graduates;

## **5-2 Quality and Standards**

The Youth polytechnics should strive to uphold a high level of trust in the skills they impart in the trainees and the training services they offer by ensuring they meet the demand and standards of the labor market and in order to do so, the study makes the following recommendations;

- i) Ensure availability of learning facilities and equipment (equipped libraries, ICT equipment, learning and practice halls, material for practical learning and instructional materials) to achieve the recommended trainee-tool ratio, (Institute of Economic Affairs – Kenya, 2018);
- ii) Increase employment of qualified instructors to achieve the recommended instructor-trainee ratio;
- iii) There should be extensive stakeholder involvement in establishing the Qualification Framework, setting the Competency Standards and benchmarking them to employers' requirements;
- iv) Establish a reliable process of assessing trainee's competence and learning outcomes and mechanisms to safeguard quality;
- v) Specify the minimum standards to be met by training providers and carry out accreditation to maintain standards and quality of training programs offered;
- vi) Develop education pathways that links youth polytechnics with formal education institutions – technical institutes, junior colleges and universities – where trainees

can transfer across courses, progress to higher levels of training or enter labor market, (World Bank, 2013);

- vii) Development of mechanisms to encourage continuous training and lifelong learning for workers to keep their skills up-to-date due to the changing economic conditions in a volatile job market.

### **5-3 Financing TVET**

The study has established that, for the period 2013 to 2019, Kakamega county annually allocated approximately 10% of annual expenditure on education and training. The study recommends that;

- i) In line with the Incheon Declaration, the County government to increase allocation on education and training to a minimum of 15%;
- ii) The County government to enhance efforts to attract financial assistance from advanced countries and international organizations like UNESCO;
- iii) Youth polytechnics to develop innovative means of raising own revenues to bridge the financing gap, by engaging in income generating activities like agribusiness, partnering with local businesses and industries to provide customized and subsidized training and charging user fees on trainees who can afford while supporting the financially distressed.

## **5-4 Demand Driven Training Data**

Kenya as a country lacks a skill audit system and a skills inventory to provide information on the labor market needs. As a result, training is undertaken without paying any relevance to the labor market needs, which has resulted to mismatch between skills demand and skills trained. This study recommends that;

- i) The adoption of a demand-driven training approach focusing on needs of employers, labor markets and individual learners, through engaging them in training provision, research, curriculum design and in-class and practical teaching, (Muthuveeran Ramasamy & Matthias Pilz 2020; Eichhorst W. et al 2012);
- ii) Establishment of a Research and Development bureau within the organizational structure well-funded to undertake research in new trends in the field of TVET and develop a skills inventory;
- iii) Due to the rapid changes in technological advancements, the youth polytechnics to be constantly be on the look-out for new trends in the market and adjust their curricula when need arises.

## **5-5 Organization and Training Provision**

There is limited support for Youth Polytechnics given that; first, most of the trainees enrolled come from poor backgrounds; and second, the general perception of vocational training from colonial era as a “second-class” avenue to the labor market and second choice to academic education meant for those who have failed in society and with below average academic

capabilities. To change this perception and ensure training is effective, relevant and responsive to the labor market, the study recommends;

- i) The government to take an enhanced supervisory role (regulation and accreditation), establishment of training infrastructure, support training of instructors while encouraging and motivating the private sector to participate in training provision;
- ii) Teaching methodology to adopt a dual training model, prioritizing practical learning with more hours allocated to field work than specialized theory and general knowledge, (Dieter Euler, 2013); (Helmut D.; Monica K.; & Johannes M. N., 2016; Eichhorst W. et al 2012);
- iii) Develop a criterion for competitively recruiting qualified instructors and improve their welfare through better employment terms and working conditions;
- iv) Establishment of mechanisms to support the professional development of instructors through in-service training and supplement their expertise with industry practitioners;
- v) Youth polytechnics besides developing human capital, should also aim on building social capital in the surrounding community.

## **5-6 Coordination and Partnerships**

To promote coordination between youth polytechnics and industries, private sector, local business and other stakeholders like research institutions and CSOs, the study recommends that;

- i) Involve the private sector in management of the Youth polytechnics through membership in the County Polytechnics Advisory Board (CPAB) and the Board of Management (BOM) of polytechnics;
- ii) Youth polytechnics to develop partnerships with local businesses and employers who are crucial in providing field training opportunities, on-the-job training; promoting apprenticeships, internships and workplace training that give trainees practical skills;
- iii) The Youth polytechnics to develop research partnerships with other training institutions, universities and other research institutions to promote research and uptake of research outputs for improved competitiveness, (Institute of Economic Affairs – Kenya, 2010).

## **5-7 Access and Participation**

The twin goal of training should be to improve the welfare of the poor, marginalized, women, youth and other disadvantaged groups by equipping them with employable skills and enhancing their chances of being gainfully employed. To realize this, the study recommends that;

- i) Establishment of a bureau within the Organizational structure responsible for matters relating to training needs of the disadvantaged members of the society and promote their access to training;
- ii) Development of incentive-based strategies that ensures disadvantaged groups like youth, women, school drop-outs, marginalized and PWD are motivated to participate in the training.



## **5-8 Monitoring, Evaluation and Feedback**

M & E system with an effective feedback mechanism is key in ensuring quality, relevance and effectiveness. Monitoring helps to measure and keep track of training progress; evaluation helps to assess the effectiveness and relevance of training; while feedback helps policy makers know what is happening and can adjust the training offered appropriately. In view of this, the study recommends that;

- i) Establishment of an electronic information management system to carry out administrative functions like personnel management, student enrollment and facilitate effective means of communication internally among polytechnics and externally with other stakeholders;
- ii) Establishment of a Knowledge Management Program for sharing knowledge generated within the polytechnics with other academic and research institutions, employers, state and non-state actors;
- iii) Institute of Economic Affairs – Kenya, (2010); (ILO, 2013) both recommended developing a framework for monitoring, evaluation and learning that is well-funded and incorporates both state and non-state actors.

## **5-9 Curriculum Development and Modularization of Training**

Curriculum is simply what trainees learn. For the purposes of ensuring training is effective and relevant, the study recommends that;

- i) Modularize the training curriculum by shifting from a single course where trainees are assessed at the end of training period to one that consists of modules (short courses) that are assessed at the end of each module;
- ii) The curriculum be developed at County level but implementation be done at two levels – County and institutional level. At County level, focus be on overall Credit Certification Framework (adopt the national framework), content, teaching methods and promoting industry-academia cooperation. At institutional level, learning fields to reflect individual polytechnic resources and respond to needs of the immediate market;
- iii) New curriculum to include common courses that administer soft skills, (ILO, 2013). The common courses may include; Morality and ethics; HIV and AIDS; Gender; Environment conservation; Entrepreneurship skills (Celina K. M, 2013); Behavioral skills (teamwork, communication, social, problem solving, diligence and creativity); Cognitive skills; Psychomotor skills; and Affective skills, (World Bank, 2010);
- iv) The integration of ICT and e-learning methodologies into the training provided by the Youth polytechnics as ICT will contribute to quality improvement, innovation and increased outreach and access to learning opportunities and help prepare for new trends and innovations like IR 4.0.

## **6. Suggested areas for further research**

The study analyzed vocational training in Korea with emphasis on success factors of Korea Polytechnic (KOPO) Colleges which develops technicians and craftsmen for practical work in the industries. The researcher recommends further research be undertaken to establish

how the Vocational Education and Training in Korea is positioning for the 4<sup>th</sup> Industrial Revolution era.

## REFERENCES

### 1. Primary References

Asian Development Bank. 2004. *Improving technical education and vocational training strategies for Asia*. (Forward by Bindu N. Lohani). Publication Stock No. 021505.

Chae, ChangKyun and Jaeho Chung. 2009. *Pre-Employment Vocational Education and Training in Korea*. World Bank Social Protection Discussion Paper Series No. 0921. Washington, D.C

County Government of Kakamega. 2014. *Polytechnics Act*. Retrieved at: <https://kakamega.go.ke/download/the-kakamega-county-polytechnics-act-2014/> (2020/06/25)

County Government of Kakamega. 2018. *County Integrated Development Plan (CIDP)*. Retrieved at: <https://kakamega.go.ke/download/county-integrated-development-plan-2018-2022/> (2020/05/19)

Jae-Hyun Park; Giwoo Lee; Suk-Geun Jang; & Baewon Son. 2012. *Role and Function of the National Technical Qualification System in the Development of Vocational Ability*. HRD Service of Korea. Ministry of Employment and Labor (MOEL). Republic of Korea

Jeong, Taek-soo. 2008. *The Evolution of the Vocational Skills Development System*. Korea

Research Institute for Vocational Education and Training (KRIVET). Seoul, Korea

Korea Polytechnic Colleges Website (<http://www.kopo.ac.kr/index.do>)

Republic of Kenya. 2017. *Basic Education Curriculum Framework*. Kenya Institute of Curriculum Development. Nairobi.

Young-Sun Ra; & Soon-Hee Kang. 2012. *Vocational Training System for a Skilled Workforce*. Korea Research Institute for Vocational Education & Training (KRIVET). Ministry of Employment and Labor (MOEL). Republic of Korea

## **2. Secondary References**

African Union. 2007. *Strategy to revitalize technical and vocational education and training (TVET) in Africa*. Addis Ababa: Bureau of the Conference of ministers of Education of the African Union;

Alex Gray. 2016. *The 10 skills you need to thrive in the Fourth Industrial Revolution*. World Economic Forum.

Amutabi, N. 2003. The 8-4-4 system of education. *International Journal of Educational Development*. Vol.23 No.3.

Ashton, D.N., Francis Green. 1996. *Education, Training, and the Global Economy*. University of California.

Ashton, D.N, Francis G., Donna J. & Johnny S. 1999. Education and Training for Development in East Asia: The Political Economy of Skill Formation in East Asian Newly Industrialized Economies. ESRC Pacific Asia Programme. London: Routledge.

Asian Development Bank. 2013. *Skills Development for Inclusive and Sustainable Growth in Developing Asia-Pacific*. Edited by Maclean R., Jagannathan S., Sarvi J. Springer Books

Becker, G. 1964. *Human Capital*. New York: NBER

Betcherman, G. K. Olivas, & A. Dar. 2004. *Impacts of active labor market programs: new evidence from evaluations with particular attention to developing and transition countries*. World Bank Social Protection Discussion Paper 0402

Booth, A. L. & Snower, D. J. eds. 1996. *Acquiring Skills: Market Failures, their Symptoms and Policy Responses*. Cambridge: Cambridge University Press.

Caillods, Francoise. 1994. Converging Trends Amidst Diversity in Vocational Training Systems. *International Labor Review*. Vol.133 (2):241—257

Celina K. M. 2013. Youth Polytechnic Education and Entrepreneurship in Kenya; (Are we Promoting Entrepreneurs?). *International Journal of Academic Research in Business and Social Sciences*. Vol. 3, No. 5 ISSN: 2222-6990

County Government of Kakamega. 2013/14 – 2018/19. *County Fiscal Strategy Papers (Various)*. Kakamega, Kenya

County Government of Kakamega. 2020. *County Polytechnic Advisory Committee Report*. Unpublished Report presented to The Governor of Kakamega County. Kakamega, Kenya.

Creswell, J. W. 2011. *Educational research: Planning, conducting, and evaluating quantitative and qualitative research (4th ed.)*. New Delhi, PHI Learning.

Creswell J. W; Plano Clark V. L. 2011. *Designing and Conducting Mixed Methods Research*. 2nd ed. Thousand Oaks, CA: Sage.

Dieter Euler. 2013. *Germany's dual vocational training system: a model for other countries?* Bertelsmann Stiftung. Carl-Bertelsmann-Straße 256, D-33311 Gütersloh

Eichhorst, W., Núria, R.P., Ricarda S. & Klaus F.Z. 2012. *A Roadmap to Vocational Education and Training Systems Around the World*. IZA Discussion Paper No. 7110. Bonn, Germany.

European Union. 2011. *The benefits of vocational education and training*. By European Centre for the Development of Vocational Training (Cedefop). Luxembourg

Fosnot, C. T. 1996. *Constructivism: Theory, perspective, and practice*. New York: Teachers College Press.

Fullbright-Anderson, K., Kubisch, A.C. & Connell, J.P. 1998. *New approaches to evaluating community initiatives: Theory, measurement, and analysis*. Volume 2. Queenstown: Aspen Institute.

Hailu, G. 2011. *Factors affecting the implementation of technical and vocational and training in selected public institutions of southern zone of Tigray* (Master's Thesis, Addis Ababa University). Retrieved from <http://etd.aau.edu.et/handle/123456789/12689>

Helmut D.; Monica K.; & Johannes M. N. 2016. *Youth Unemployment in Kenya: A ticking Time Bomb*. Longhorn Publishers Limited, Nairobi.

International Labor Organization. 1998. *World Employment Report 1998—99: Employability in the Global Economy, How Training Matters*. Geneva. Switzerland.

International Labor Organization. 2004. *Implications of globalization and economic restructuring for skills development in sub-Saharan Africa*. By Richard K. Johanson; Working Paper No. 29. Geneva, Switzerland

International Labor Organization. 2012. *International Standard Classification of Occupations: Structure, group definitions and correspondence tables*. ISCO-08- Volume 1. 2012.

International Labor Organization. 2013. *Kenya: Making Quality Employment the Driver of Development*. ISBN: 978-92-9251-024-4. Geneva, Switzerland.

Institute of Economic Affairs – Kenya. 2010. *The Dynamics and Trends of Employment in Kenya*. Nairobi, Kenya. ISBN: 9966-7391-5-7

Institute of Economic Affairs – Kenya. 2018. *Improving the Quality of Service in Youth Polytechnics: A Demand-Led Approach to Skills Planning and Development*. Nairobi, Kenya.

John W. Simiyu. 2009. *Revitalizing a Technical Training Institute in Kenya: A case study of Kaiboi Technical Training Institute, Eldoret, Kenya*. UNESCO-UNEVOC. Bonn, Germany. Retrieved from <http://www.unevoc.unesco.org/publications>

John W. Simiyu. 2010. *A Study of a Current Model for Integrating Education for Sustainable Development in Centres of Excellence in TVET in Kenya*. UNESCO-UNEVOC. Bonn, Germany. Retrieved from [https://unevoc.unesco.org/fileadmin/docs/CS\\_vol2\\_ESD\\_Africa\\_Final.pdf](https://unevoc.unesco.org/fileadmin/docs/CS_vol2_ESD_Africa_Final.pdf)



Jon Lauglo. 2006. *Research for TVET Policy Development*. InWEnt – Internationale Weiterbildung und Entwicklung gGmbH. Bonn, Germany

Kigwilu, P. C & Akala, W. J. 2017. Resource utilization and curriculum implementation in community colleges in Kenya. *International Journal for Research in Vocational Education and Training* 4(4):369-381

Kim, L. 1997. *From imitation to innovation: The dynamics of Korea's technological learning*. Boston, MA: Harvard Business School Press.

Kingombe, C. 2011. *Lessons for Developing Countries from Experience with Technical and Vocational Education and Training*. Working Paper No. F39011-SLE-1. International Growth Centre. London School of Economics and Political Science, Houghton Street, London.

KIPPRA. 2009. *Improving technical and vocational training in Kenya: lessons from selected countries*. By Onsomu, E, Wambugu, A & Wamalwa, F. KIPPRA discussion paper no. 105, Nairobi, Kenya. Viewed 29 Mar 2020, <http://www.kippira.org/docs/DPNo.105.pdf>

KIPPRA. 2019. *Revitalizing Technical and Vocational Training in Kenya*. By Mercy Matwere & Mary Mwami. Nairobi, Kenya. Accessed at <https://kippra.or.ke/revitalizing-technical-and-vocational-training-in-kenya/>

Korea Education Development Institute (KEDI). 2015. *Education for the Future: Korean Education Policy Development*. Seoul, Korea.

Korea Research Institute for Vocational Education and Training (KRIVET). 2001. *Vocational Education System in Korea*. By Ki-Hong Kim. Seoul, South Korea

Korea Research Institute for Vocational Education and Training (KRIVET). 2007. *Human Resources Development Indicators in Korea*. Seoul, Korea

Korea Research Institute for Vocational Education and Training (KRIVET). 2013. *Vocational Education and Training in Korea*. Edited by: Young-bum Park & Jisun Chung. Seoul, Korea.

Matthias Pilz. 2016. Training Patterns of German Companies in India, China, Japan and the USA: What Really Works? *International Journal for Research in Vocational Education and Training (IJRVET)*. Vol. 3, Issue 2:66-87. <https://DOI:10.13152/IJRVET.3.2.1>

Mayer, Jorg. 2000. *Globalization, Technology Transfer and Skill Accumulation in Low-Income Countries*. WIDER Project, No. 150, United Nations Conference on Trade and Development (UNCTAD). Geneva: UNCTAD

Morgan, D. L. 1996. Focus groups. *Annual Review of Sociology*, 22, 129-152. Retrieved from <http://search.proquest.com/molloy.idm.oclc.org/docview/199572794?accountid=28076>

Moses O. Oketch. 2007. To vocationalise or not to vocationalise? Perspectives on current trends and issues in technical and vocational education and training (TVET) in Africa. *International Journal of Education Development*. 27(2): 220-34.

Mupinga, M.; Busby, R. & Ngatia, W. 2006. Postsecondary Technical and Vocational Education Institutions in Kenya: Needs and Challenges. *International Journal of Vocational Education and Training*, 14(1):21–35.

Muthuveeran Ramasamy and Matthias Pilz. 2020. Vocational Training for Rural Populations: A Demand-Driven Approach and its Implications in India. *International*

*Journal for Research in Vocational Education and Training (IJRVET)*2020, Vol. 7, Issue 3:256–277 <https://journals.sub.uni-hamburg.de/hup2/ijrvet/article/view/443/172>

Myung-Soo, Park. Vocational Training in Korea. In *Human Development: Education and Health Policy*. KDI and World Bank.

Okaka, P.O. 2001. *Technical and vocational education and training in Kenya*. A paper presented at the Sub-regional workshop on the Promotion and Reform of Technical and Vocational Education and Training in Africa, Kampala, Uganda, 10–13 December 2001.

Peter E. Doolittle & William G. Camp. 1999. Constructivism: The Career and Technical Education Perspective. *Journal of Vocational and Technical Education*. 16:1. Accessed at <https://scholar.lib.vt.edu/ejournals/JVTE/v16n1/doolittle.html> (2020/05/23, 1.22 p.m.).

Republic of Kenya. 2008. *Kenya Vision 2030*. Government Printer. Nairobi

Republic of Kenya. 2010. *The Constitution of Kenya*. Government Printer. Nairobi

Republic of Kenya. 2012a. *Sessional Paper No 14: Reforming education and training sectors in Kenya*. Government Printer. Nairobi

Republic of Kenya. 2012b. *Taskforce Report on Educational Reforms*. Government Printer. Nairobi

Republic of Kenya. 2012c. *Policy Framework for Education and Training*. Government Printer. Nairobi

Republic of Kenya. 2012d. *The County Governments Act*. Government Printer. Nairobi

Republic of Kenya. 2013. *Technical and Vocational Education and Training Act*. Government Printer, Nairobi. (<https://www.education.go.ke/index.php?catid=0&id=19>.)

Republic of Kenya. 2014. *Kenya Gazette Supplement. The Kenyan National Qualifications Framework Act*. Government Printer. Nairobi

Republic of Kenya. 2015. *Technical and Vocational Education and Training Regulations 2015*. Government Printer. Nairobi

Republic of Kenya. 2016. *Report on Needs Assessment for School Curriculum in Kenya*. Kenya Institute of Curriculum Development. Nairobi.

Republic of Kenya. 2018a. *Economic Survey Report*. Kenya National Bureau of Statistics. Nairobi.

Republic of Kenya. 2018b. *National Education Sector Strategic Plan, 2018 – 2022*. Ministry of Education. Nairobi, Kenya

Republic of Kenya. 2018c. *Technical and Vocational Education and Training Authority (TVETA) Strategic Plan 2018-2022*. Kenya Literature Bureau, Nairobi.

Republic of Kenya. 2018d. *The 2015/16 Kenya Integrated Household Budget Survey (KIHBS) Labor Force Basic Report*. Kenya National Bureau of Statistics. Nairobi.

Republic of Kenya. 2019a. *Statistical Abstract*. Kenya National Bureau of Statistics. Nairobi.

Republic of Kenya. 2019b. *2019 Kenya Population and Housing Census Volume I: Population by County and Sub-County*. Kenya National Bureau of Statistics. Nairobi.

Republic of Kenya. 2019c. *2019 Kenya Population and Housing Census Volume IV: Distribution of Population by Socio-Economic Characteristics*. Kenya National Bureau of Statistics. Nairobi.

Republic of Kenya. 2019d. *Gross County Product Report*. Kenya National Bureau of Statistics. Nairobi.

Republic of Korea. *Economic Development Plans*. Seoul, Korea (Various)

Republic of Korea. 2016. *Mid- to Long-Term Master Plan in Preparation for the Intelligent Information Society: Managing the Fourth Industrial Revolution*. Ministry of Science, ICT and Future Planning (MSIP). Seoul, Korea

Republic of Korea. 2017. *Education, the driving force for the development of Korea*. Ministry of Education. Seoul, Korea

Republic of Korea. 2019. *Story of Korea's Economic Development: Second Story*. Ministry of Economy and Finance; GKED Center; KDI. Seoul, Korea

Republic of Korea. 2020. *Skills Development Policy in Korea*. Ministry of Employment and Labor. Seoul, Korea.

Shankar, Raja & Anwar Shah. 2001. *Bridging the Economic Divide within Nations: A Scorecard on the Performance of Regional Development Policies in Reducing Regional Income Disparities*. World Bank. Washington, D.C.

Susan Ngure. 2018. A Proposed National Model of Vocational Education and Training for Micro and Small Enterprises in Kenya. *International Journal of Vocational Education and Training Research*. Vol. 4, No. 1, 2018, pp. 28-40. doi: 10.11648/j.ijvetr.20180401.15

Schwab, K. 2016. *The fourth industrial revolution: What it means and how to respond*. *World Economic Forum*. Retrieved from <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>

UNESCO. 1999. Second International Congress on Technical and Vocational Education and Training: *Establishment of an international long-term Programme for the development of technical and vocational education*. Seoul. Korea

UNESCO-UNEVOC. 2009. International handbook of education for the changing world of work: Bridging academic and vocational learning. Edited by Maclean, Rupert & Wilson, N. Springer Publishers. New York & Bonn. Germany.

UNESCO. 2010. *Reaching the marginalized: EFA global monitoring report 2010*. UNESCO Publishing and Oxford University Press. Paris and London.

UNESCO. 2012. Third International Congress on Technical and Vocational Education and Training: *The Shanghai Consensus on Building skills for work and life*. Paris. France

UNESCO. 2015a. *Education 2030: Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning*. Seoul, South Korea (<https://iite.unesco.org/publications/education-2030-incheon-declaration-framework-action-towards-inclusive-equitable-quality-education-lifelong-learning/>)

UNESCO. 2015b. *Review of the Pacific Framework for Technical and Vocational Education and Training*. By UNESCO & Pacific Community. Noumea, New Caledonia.

UNESCO-UNEVOC. 2018a. *TVET Country Profiles, Kenya*. Bonn, Germany

UNESCO-UNEVOC. 2018b. *TVET Country Profiles, South Korea*. Bonn, Germany

Weiss, Carol. 1972. *Evaluation Research: Methods of Assessing Program Effectiveness*. Englewood Cliffs, N.J.: Prentice-Hall.

Weiss, Carol. 1995. *Nothing as Practical as Good Theory: Exploring Theory-Based Evaluation for Comprehensive Community Initiatives for Children and Families* in 'New Approaches to Evaluating Community Initiatives'. Aspen Institute.

Won-Gyu Hwang. 2013. Modeling and sharing Korean development expertise for African growth. In: Ohno, K., & Ohno, I. 2013. *Eastern and western ideas for African growth: Diversity and complementarity in development aid*. Taylor & Francis Group. UK

World Bank. 1991. *Vocational and Technical Education and Training: A World Bank Policy Paper*. Washington, D.C.

World Bank. 1992. *How the Macroeconomic Environment Affects Human Resource Development*. By Adams, A. V.; Goldfarb, R.; and Kelly, T. World Bank Policy Research Education and Employment Working Papers, No. WPS 828. Washington, D.C. USA.

World Bank. 1999. *World Development Report: Knowledge for Development*. Washington, D.C.

World Bank. 2008a. *An African Exploration of the East Asian Education Experience*. Washington, D.C.

World Bank. 2008b. *Youth in Africa's Labor Market*. Edited by Marito Garcia and Jean Fares. Washington, D.C.

World Bank. 2010. *Stepping Up Skills for more Jobs and Higher Productivity*. Washington, D.C.

World Bank. 2012. *World Development Report 2013: Jobs*. Washington, DC: World Bank. DOI:10.1596/978-0-8213-9575-2.

World Bank. 2013. *What Matters for Workforce Development: A Framework and Tool of Analysis*. Washington, D.C.

World Bank. 2015. *Tanzania Workforce Development: SABER Country Report*. Washington, D.C.

World Economic Forum. 2016. *The Future of Jobs: Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution*. Retrieved from [http://www3.weforum.org/docs/WEF\\_Future\\_of\\_Jobs.pdf](http://www3.weforum.org/docs/WEF_Future_of_Jobs.pdf)

Young-bum Park & Jung-woo Kim. 2017. *Agenda for the Future of Vocational Competency Development Training*. In 'The Present and Future of Vocational Competency Development Training in Korea. HRD, Korea.

Young-Sun Ra and Kyung Woo Shim. 2009. *The Korean Case Study: Past Experience and New Trends in Training Policies*. World Bank Social Protection Discussion Paper Series No. 0931. Washington, D.C

### **Websites Accessed**



<https://www.mum-writes.com/2018/06/rex-facing-the-4th-industrial-revolution-with-holistic-learning/#more-19974> (Accessed 2020/06/28)

<https://www.businesscalltoaction.org/news/tackling-youth-unemployment-kenya-through-public-private-collaboration> (Accessed 2020/04/08)

International Labor Organization. 2020. *ILOSTAT*. <https://ilostat.ilo.org/> (Accessed, 2020/06/21)

National Education Statistics Research Division, Korean Educational Development Institute (<https://kess.kedi.re.kr>, Accessed, 2020/07/10)

Republic of Kenya. Ministry of Education. [www.education.go.ke](http://www.education.go.ke) (Accessed, 2020/02/20)

Republic of Korea. Ministry of Education. <http://english.moe.go.kr/english> (Accessed, 2020/07/02)

Republic of Kenya. National Industrial Training Authority. [www.nita.go.ke](http://www.nita.go.ke) (Accessed, 2020/09/19)

Republic of Kenya. Technical and Vocational Education and Training Authority. <http://www.tvetauthority.go.ke> (Accessed, 2020/03/19)

UN: <https://www.un.org/sustainabledevelopment/sustainable-development-goals/> (Accessed, 2020/10/07)

UNESCO Digital Library. <https://unesdoc.unesco.org> (Accessed, 2020/02/07)

UNESCO Institute for Statistics (UIS). <http://uis.unesco.org> (Accessed, 2020/03/19)

World Bank. 2020. *World Development Indicators*. <https://data.worldbank.org> (Accessed, 2020/11/23).

## APPENDIX

### 1. List of Korea Polytechnic Colleges

**Table 7:** List of KOPO College Campuses

Polytechnic College	Website	Province	No. of Entrants for School Year 2018	Enrollment	Graduates	Faculty Members and Clerical Staffs			
						Full-time	Non-Full-time	Part-time Lecturers	Clerical Staffs
ICT Polytech Institute of Korea	<a href="http://www.ict.ac.kr">www.ict.ac.kr</a>	Gyeonggi	160	635	123	18	-	8	25
Seoul Jungsu Campus of Korea Polytechnic	<a href="http://www.kopo.ac.kr/jungsu">www.kopo.ac.kr/jungsu</a>	Seoul	615	2,261	588	73	3	78	22
Seoul Kangseo Campus of Korea Polytechnic College	<a href="http://www.kopo.ac.kr/kangseo">www.kopo.ac.kr/kangseo</a>	Seoul	260	734	192	28	4	45	11
Seong Nam Campus of Korea Polytechnic	<a href="http://www.kopo.ac.kr/seongnam">www.kopo.ac.kr/seongnam</a>	Gyeonggi	475	1,633	412	46	4	50	12
Korea Polytechnic	<a href="http://www.kopo.ac.kr/jeju">www.kopo.ac.kr/jeju</a>	Jeju	25	53	6	4	-	8	10
Incheon Campus of Korea Polytechnic	<a href="http://www.kopo.ac.kr/incheon">www.kopo.ac.kr/incheon</a>	Incheon	885	3,627	1,008	98	6	125	30
Anseong Campus of Korea Polytechnic	<a href="http://www.kopo.ac.kr/anseong">www.kopo.ac.kr/anseong</a>	Gyeonggi	340	998	153	33	3	40	9
Chuncheon Campus of Korea Polytechnic III	<a href="http://www.kopo.ac.kr/chuncheon">www.kopo.ac.kr/chuncheon</a>	Gangwon	190	583	159	25	2	20	16
Gangneung Campus of Korea Polytechnics	<a href="http://www.kopo.ac.kr/gangneung">www.kopo.ac.kr/gangneung</a>	Gangwon	60	171	54	6	-	15	9
Wonju Campus of Korea Polytechnic	<a href="http://www.kopo.ac.kr/wonju">www.kopo.ac.kr/wonju</a>	Gangwon	25	59	26	7	-	2	8
Korea Polytechnic IV	<a href="http://www.kopo.ac.kr/daejeon">www.kopo.ac.kr/daejeon</a>	Daejeon	470	1,673	437	53	10	43	18
Cheongju Campus of Korea Polytechnic	<a href="http://www.kopo.ac.kr/cheongju">www.kopo.ac.kr/cheongju</a>	Chungbuk	350	1,288	362	35	-	38	10
Asan Campus of Korea Polytechnic IV	<a href="http://www.kopo.ac.kr/asan">www.kopo.ac.kr/asan</a>	Chungnam	255	932	245	35	4	30	9
Hongseong Campus of Korea Polytechnics	<a href="http://www.kopo.ac.kr/hongseong">www.kopo.ac.kr/hongseong</a>	Chungnam	120	426	113	18	3	12	8
Gwangju Campus of Korea Polytechnic V	<a href="http://www.kopo.ac.kr/gwangju">www.kopo.ac.kr/gwangju</a>	Gwangju	385	1,467	335	42	12	43	15
Gimje campus of Korea Polytechnics	<a href="http://www.kopo.ac.kr/gimje">www.kopo.ac.kr/gimje</a>	Jeonbuk	265	896	225	33	3	22	10
Mokpo Campus of Korea Polytechnic V College	<a href="http://www.kopo.ac.kr/mokpo">www.kopo.ac.kr/mokpo</a>	Jeonnam	125	528	115	20	1	13	10
Iksan Campus of Korea Polytechnic	<a href="http://www.kopo.ac.kr/iksan">www.kopo.ac.kr/iksan</a>	Jeonbuk	50	154	51	10	-	9	10

Polytechnic College	Website	Province	No. of Entrants for School Year 2018	Enrollment	Graduates	Faculty Members and Clerical Staffs			
						Full-time	Non-Full-time	Part-time Lecturers	Clerical Staffs
Suncheon Campus of Korea polytechnics	<a href="http://www.kopo.ac.kr/suncheon">www.kopo.ac.kr/suncheon</a>	Jeonnam	-	23	-	7	1	2	9
Daegu Campus of Korea Polytechnic	<a href="http://www.kopo.ac.kr/daegu">www.kopo.ac.kr/daegu</a>	Daegu	445	1,521	473	50	5	48	20
Gumi Campus of Korea Polytechnic	<a href="http://www.kopo.ac.kr/gumi">www.kopo.ac.kr/gumi</a>	Gyeongbuk	280	945	230	36	3	31	10
Yeongju Campus of Korea Polytechnic VI	<a href="http://www.kopo.ac.kr/yeongju">www.kopo.ac.kr/yeongju</a>	Gyeongbuk	30	92	24	6	-	6	9
Changwon Campus of Korea Polytechnic	<a href="http://www.kopo.ac.kr/changwon">www.kopo.ac.kr/changwon</a>	Gyeongnam	605	2,374	659	59	7	76	20
Busan Campus of Korea Polytechnic VII	<a href="http://www.kopo.ac.kr/busan">www.kopo.ac.kr/busan</a>	Busan	445	1,611	407	44	3	53	11
Ulsan Campus of Korea Polytechnic	<a href="http://www.kopo.ac.kr/ulsan">www.kopo.ac.kr/ulsan</a>	Ulsan	405	1,368	360	37	4	57	15
Bio Campus of Korea Polytechnic	<a href="http://www.kopo.ac.kr/bio">www.kopo.ac.kr/bio</a>	Chungnam	180	595	182	24	3	20	16
Textile & Fashion campus of Korea Polytechnic	<a href="http://www.kopo.ac.kr/tf">www.kopo.ac.kr/tf</a>	Daegu	145	340	146	25	-	28	8
Aviation Campus of Korea Polytechnic	<a href="http://www.kopo.ac.kr/kapc">www.kopo.ac.kr/kapc</a>	Gyeongnam	240	1,038	244	25	4	23	9

**Source:** National Education Statistics Research Division, Korean Educational Development Institute (<https://kess.kedi.re.kr>)

## 2. List of Youth Polytechnics and Staff Establishment in Kakamega County

**Table 8:** List of Youth Polytechnics and Staff Establishment

S. No	Polytechnic Name	Staffing		
		Permanent	Contract	BOG
1	Mumbetsa	1	3	4
2	Marakusi	1	4	4
3	Sikulu P.A.G	2	2	3
4	Khwisero	2	6	6
5	Mautuma	2	5	3
6	Malava	2	2	1
7	Kabras	4	6	3
8	Shidodo	1	4	-
9	Mawe Tatu	2	2	2
10	Mabanga	1	2	1
11	Chombeli	1	1	2
12	Shianda	3	8	3
13	Bungasi	3	2	2
14	Butere	3	6	1
15	St Pauls Mutua	1	2	3
16	Magale	1	2	3
17	Mwira	1	3	1
18	St Peters Emulakha	3	7	3
19	Soy	2	5	3
20	Itumbu	2	1	1
21	Chekalini	1	3	5
22	Binyenya	2	1	2
23	St Anns Indangalasia	2	2	-
24	Matioli	4	8	-
25	St Philip Mukomari	2	1	2
26	West Isukha	2	1	1
27	Shilolavakhali	2	4	3

S. No	Polytechnic Name	Staffing		
		Permanent	Contract	BOG
28	Shitoli	2	4	3
29	St Jerome Savane	3	3	3
30	Musamba	2	2	2
31	Matungu	4	4	2
32	Mukhuru	2	2	1
33	Eshiabwali	2	2	2
34	Lunganyiro	2	4	1
35	Lumakanda	1	3	3
36	Bunyala Central	2	4	2
37	Murhanda	2	3	1
38	Shieywe	2	3	2
39	Kisa West	1	2	1
40	Mundeku	2	2	2
41	Imanga	2	2	1
42	Burundu	1	6	3
43	Friends Kimangeti	2	1	2
44	St Teresa Malava	5	3	2
45	South Marama	1	2	2
46	Bulanda	1	2	2
47	Butsotso Central	1	2	3
48	Malaha	2	2	2
49	St Gerald Shitao	2	2	2
50	Bushiangala	3	2	5
51	St Teresa Musoli	2	3	4
52	Lugala	1	4	6
53	Manda	2	3	1
54	Cheptuli	2	2	1
55	Kakamega	3	6	2
56	Madala	1	1	1
57	Nzoia	2	1	5
58	Shagungu	2	1	2
59	Matawa	2	4	3
60	St Raphael Malimili	2	2	2
61	Friends Sango	1	0	3

S. No	Polytechnic Name	Staffing		
		Permanent	Contract	BOG
62	Masaba	1	1	3
63	Ack Machine	3	3	0
	<b>Total</b>	<b>124</b>	<b>180</b>	<b>145</b>

**Source:** County Polytechnic Advisory Committee Draft Report. 2020.

## ABSTRACT IN KOREAN

### 국문 초록

사람에 대한 투자 자본의 중요한 요소 TVET 시스템 따라서,세계에서의 작업에 대한 기술과 지식에 의해 개발된 TVET 기관,장기적인 기술에 투자하는 공식 교육 기관 경쟁력을 높이는 나라,바로 개선 작업자 생산성,혁신 및 경제적 기회를 방식으로 그것을 지속적이고 포괄적인 발전에 달성하는 핵심부 TVET 기관이 케냐에서 설립되었습을 훈련하는 숙련 노동자를 향해 청소년 교육,학교를 중퇴하고 실업자입니다. 학생은 것으로 예상된 중요한 역할을 개발에 필요한 기술을 통해 즉각적인 노동 시장의 분석을 그들의 성능을 보여줍니다 좋은 불만의 교육을 제공하는 결과 도전의 낮은 청소년 노동 참여율,높은 실업률과 데이터를 국제 노동 기구(2019)을 나타냅니다 (40%, 18.34%각)에 비해 전반적인 국가 통계 (70%, 9.31%각). 무능력의 교육 시스템의 역할을 언급하의 번호를 포함하여,문제의 부족을 우선순위,약한 학계-산업 협력,부적절 한 금융,표준 이하 교육 시설과 장비,부정적인 인식에 의해 사회 및 저조한 동기 부여 선생님입니다. 는 노력을 재배치 TVET 으로 교육을 위한 새로운 드라이버의 경제 성장,정부가 시작되는 몇 가지 개혁을 포함하여,예산 증가 할당 수업료를 지불하에 대한 연수 및 기업 여러한 홍보 캠페인은 부정적인 대중의 인식이다. 에서 준비한 케냐 TVET



시스템으로 환영하는 핵심 요소에 기여하는 국가의 급속한 경제적 성공으로 그것에서 중요한 역할을 개발하는 데 필요한 기술을 개발하는 산업 부문에 있습니다. 1987 년과 1997 년의 기간 동안,한국은 전체 고용 근처 2.4%의 평균 연간 실업률을했다. 이 배경에는 한국의 직업 훈련을 효과적으로 수행 한 요인을 조사하기 위해 연구가있었습니다. 연구에 사용되는 프레임워크에 대한 평가 TVET 에 의해 개발되었 태평양 지역 사회와 세계 은행은 인력 개발 (WfD) 진단 기구를 조사하는 직업훈련에서 한국에 초점을 맞추고,폴리테크닉 대한민국 (KOPO) 대학의 설립 및 개발 산업 노동자입니다. 분석에 사용된 데이터에 KOPO 대학 사이트,웹사이트의 관련 정부부처 및 기관에 의해 출판 다른 연구는 조직이 다음과 같 GKED,KRIVET 고 HRD 서비스입니다. 연구 결과를 나타내는 직업 교육을 만들 수 있었다 큰 수영장의 숙련 인력이었 생산적이고 혁신적인 제공함으로 한국 최첨단 경쟁력 개발에 필요한. 코포대학은 성공 요인 중 좋은 조직이다;교육 우선 순위와 국가 개발 우선 순위 사이에 결합; 교육 지원하는 법적인 프레임워크;계획에 대한 교육 R&D 투자,신뢰할 수 있는 데이터의 개발이 높은 사용의 제공 및 품질 표준을 준수하는 가까운 학 협력,고품질 교육 인프라 장비 라이브러리,통신 장비,학습 및 연습실,그리고 가난한 청소년 및 소외된 그룹 권장 사항을 참조하십시오. 연구는 데 도움이 될 것이 카운티 정부의 카카 메가

으로 그녀의 목표와 개혁을 청소년들에게 전문가에 효과적인 생산 기술에서  
필요한 노동 시장과 데 도움이 케냐의 열망하는 비전을 달성하고 2030 년 지속  
가능한 개발 목표 4.

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Viva veritas lux mea!