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Jiexi Jia

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Abstract

Vocational education and training (VET) has in recent years become a method in development assistance, especially towards regions facing youth employment challenges. Through offering sector-specific skills training, VET plays a vital role at the labor market, and could play an important role in school to work transition for youths. Studies have failed to reach consensus concerning the relation between VET and employment. However, empirical evidence from several randomized controlled trials (RCTs) proves a positive causal relation, with varied impact estimates. Sample data from three of the United Nations Industrial Development Organization (UNIDO) projects shows a positive impact the trainings had on indicators of participants' labor market outcome. By comparing settings, designs and results between two similar RCTs and among the UNIDO projects, i) a course design reflective of market demands; ii) an inclusive recruitment for targeted individuals; and iii) a robust evaluation system are key for an effective VET program.

Keywords: vocational training, youth employment, labor market outcomes, skills development

Abstrakt

Berufliche Bildung und Ausbildung (VET) ist in den letzten Jahren zu einer Methode in der Entwicklungshilfe geworden, insbesondere in Gebieten, die mit Herausforderungen bei der Jugendbeschäftigung konfrontiert sind. Durch das Angebot branchenspezifischer Qualifizierung spielt die Berufsbildung eine wichtige Rolle auf dem Arbeitsmarkt und könnte eine wichtige Rolle beim Übergang von der Schule in den Beruf für Jugendliche spielen. Studien haben keinen Konsens über die Beziehung zwischen Berufsbildung und Beschäftigung erzielt. Empirische Beweise aus mehreren randomisierten kontrollierten Studien (RCTs) belegen jedoch einen positiven kausalen Zusammenhang mit unterschiedlichen Wirkungsschätzungen. Beispieldaten aus drei Projekten der Organisation der Vereinten Nationen für industrielle Entwicklung (UNIDO) zeigen einen positiven Einfluss der Schulungen auf die Indikatoren der Arbeitsmarktergebnisse der Teilnehmer. Durch den Vergleich von Einstellungen, Designs und Ergebnissen zwischen zwei ähnlichen RCTs und zwischen den UNIDO-Projekten, i) ein Kursdesign, das die Marktanforderungen widerspiegelt; ii) eine integrative Rekrutierung für gezielte Personen; und iii) ein robustes Bewertungssystem sind der Schlüssel zu einem effektiven Berufsbildungsprogramm.

Schlagwörter: Berufsausbildung, Jugendbeschäftigung, Arbeitsmarktergebnisse, Kompetenzentwicklung

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Introduction

Employment challenge hinders a country's economic growth and its sustainable development; it also impedes individuals' evolvement process and social inclusion. For a world facing a population of 10 billion by 2055 when more than 95% of this growth will happen in the low and middle-income countries, tackling the employment issue in developing economies can ensure a steady and sustainable growth globally (AFIDEP, 2018), for young people constitutes a significant impact at the labor market. However, in 2020, over 200 million young people were unemployed (ILO, 2020). What is more concerning is that among those who are employed, many experience an unsatisfactory employment situation. What can be done to improve young people's employment?

Vocational education and training (VET) would be the answer for many. VET programs offer trainees short-term training (no longer than one year) on sector-specific skills and a certificate, which is recognized by the sector, at the end of the training. From apprenticeship to post-secondary education, VET was first considered as a method for skills development for disadvantaged people in the 1970s. It was only until recent decades, VET started to gain recognition for its effect on skills development. Nowadays, VET is a common tool for International Organizations (IOs), development agencies and governments to address issues related to economic development. Even though there is no empirical evidence on VET's impact on economic growth, VET has a direct impact on a number of labor market outcomes. Among other variables as researchers found that VET has positive impacts on young people's school to work transition, sector-specific skills development and increases the flexibility and mobility of individual's career choices. VET's long-term benefit for labor market outcomes has not been proved. Like VET, Randomized Controlled Trials (RCTs) is another method more often used under the context of economic development, where two groups are randomly selected from a homogeneous population with the treatment group received the intervention and compare with the control group. When correctly designed and implemented, RCTs can allow researchers to estimate the causal impact of a certain intervention in an unbiased way. Interestingly, impact of VET is often the topic of RCTs. The paper will later introduce the two RCTs estimating the impact of VET on labor market outcome, and analyze the possible causes for the opposing results from the two RCTs.

The impact of VET on employment is not a new topic. Numbers of interventions and insightful research have been designed and carried out by development economists evaluating and estimating, and each study presents sometimes opposing estimates of the impact. What make the estimates of treatment effect so diverse? Does bigger estimates mean a more effective VET program?

Therefore, this paper intends to establish a clearer understanding of the impact that is affected by numerous variables and country-specific context. The paper includes a chapter on the evaluation framework of the VET, in order to gain a more systematic knowledge of VET for the evaluation of three VET projects in Zambia and Morocco, implemented by the United Nations Industrial Development Organization (UNIDO), after evaluating the impact of these three VET projects using a small sample data from three VET projects. The evaluation of the baseline-endline comparison of the 275 participants show a positive impact of trainings on the indicators of the labor market outcomes, namely, job situation (54.73 percent of the participants felt a better employment), earning (37 percent admitted an increase in their salaries) and financial sustainability (26 percent increase).

Due to the absence of a control group in the available sample data, we cannot estimate the treatment effects. But by laying out the designs, settings and objectives of the different RCTs, the estimates are constantly affected by “a prosperous training sector selection”, “motivated participants”, or “counter-effects between outcomes”. In other words, VET’s design, participants and the project’s economic and social settings influence the depth/effectiveness of VET’s impact. Next, two treatment results comparisons of UNIDO projects were conducted with one observing how external factors influence the treatment results of VET, and the other on internal factors.

The paper observes, the positive impact of VET can be amplified when when: i) training courses are more scientifically designed based on demographical, economic, social context of the host country; ii) a more strategic and inclusive approach is followed in recruitment process; and iii) a robust up-to-date evaluation system is set up.

1. Literature Survey

1.1. History of Vocational Education and Training (VET)

Vocational education and training (VET) is commonly known as a type of a post-secondary education or firm provided training that equips people with practical skills for a specific job position, trade or craft. The origin of VET can be traced back to the advent of civilization where apprenticeships were taken up by young people to learn from blacksmiths, carpenters, or merchants.¹ VET was a coherent part of the general education. The concept of VET became into what we familiarize ourselves with today in the early twentieth century. In the 1970s, the ‘vocationalization’ of education started to focus on the social demand for skills and competences that could be provided to disadvantaged groups (Lauglo, 2004). With the spread and development of industrializations, Western countries sensed the need to have a skilled workforce to meet up with growing labor market demands of specialized sectoral productions, thus started to divert funds to specific schools and companies.

In the United States, the Smith-Hughes Act of 1917 first authorized federal funding for vocational training in agriculture, trades and industry, and homemaking, in a bid to promote vocational training and isolate it from the rest of the curriculum.² European countries developed three basic models of VET by the first half of the 20th century (See Appendix). Britain followed a “liberal market model”, where the organizations and curriculum of the training was determined by the market demands, labor representatives, and companies. France employed a “state-regulated model”, where the state decided the organization, curriculum, and certification of the training. Whereas is Germany, the “dual corporate model” was practiced. Curriculum was determined jointly by entrepreneurs, unions and the state. Trainees were financed by either companies or the state. And the certifications were generally recognized (CEDEFOP, 2004).

For Africa, similar kinds of VET started to emerge in the 1950s, when the transition of colonialism and independence took place. With an increased focus on state formation and

¹ *Encyclopedia of Education*, 2002, "[History of Vocational and Technical Education](#)" The Gale Group, Inc. Retrieved April, 2022.

² Kern Alexander; Richard G. Salmon; F. King Alexander (2014). *Financing Public Schools: Theory, Policy, and Practice*. Routledge. p. 228. ISBN 978-1-135-10656-0.

development through industrialization, came an increase in African schooling (McGrath 2018). However, the rising number of vocational schools and trainees with specialized skills could not counterbalance the impact of low productivity and inefficiency of the domestic market. ‘Educated unemployment’ became a phenomenon, which resonates the ‘vocational school fallacy in development planning’ warned by Foster (1965), who argued that general education is what was needed by post-independence labor market, rather than vocational training. Relevant literatures also believe that the VET system is characterized by inequalities and exclusions, which have led to an unsatisfactory effect of African schools (McGrath, 2020). Overall speaking, countries with non-dynamic economic development often struggle to establish a dynamic VET equipped with satisfactory curriculum and vibrant linkage to firms by themselves, hence struggle to counter the labor market mismatch to tackle unemployment.

The current discussion of VET takes into the account that the overall growth, individual’s employability and companies’ productivity all requires specialized and up-to-date competences, rather than what is offered by general educational schools. VET might be common and institutionalized in formal education systems, but it can also be found in non-formal learning structures on farms and in businesses. The key issue is the connections between investments in training to build human capital and promote economic and social growth, rather than concrete education system structures (Wallenborn, 2010).

1.2. VET as a Tool for Economic Development

Recent decades, vocational training has risen and been practiced as a tool for economic development. The World Bank and the United Nations Educational, Scientific and Cultural Organization (UNESCO) prescribe vocational training for developing countries as a mean to “reduce poverty, promote economic growth and increase competitiveness.”³ By providing skills that are directly applicable at the workplace to individuals, VET is believed to have direct and immediate effects on productivity (Nilsson, 2010). And by eliminating obstacles to education

³ Comyn, P. and Barnaart, A. (2010), ‘TVET reform in Chongqing: big steps on a long march’, *Research in Post-Compulsory Education*, 15, 1, 49-65

and training, as well as promoting access to the labor market, VET can support social inclusion (European Commission, 2007).

Recent research are able to establish causal links between training and productivity at firm level. The first meta-study reports on 19 studies in 10 countries. Two observations were made: i) gains are generated for companies through training and they were equally divided between workers, which manifests in increased wages, and companies; ii) the impact of training was mostly felt in connection with structural change (OECD, 1998). In 2005, Cedefop conducted the second meta-study, where 13 studies from 8 countries were conducted based on research from the late 1990s to early 2000s (Descy & Tessaring, 2005). The findings appeared to be hugely similar to the ones in OECD study. In other words, both studies confirmed the positive relation between training and productivity (both of workers and companies).

Now that it's proven that VET increases productivity at firm level, is it logical to say that a similar effect on macroeconomic development can be observed? The fact that the concept of VET's private and social benefits is multidimensional and has to be analyzed within proper context makes it impossible to be defined in an unambiguous manner (Stevenson, 2005). The assumption that VET has a positive effect on economic growth and social inclusion has been repeated rather frequently, while the empirical evidence to support the assumption is yet to suffice. In Psacharopoulos and Patrinos (2004), there presents the results of 17 studies on the rate of return to VET. The mean value of the private rates of return for TVET (Technical and vocational education and training) at the secondary level is 10.5 percent. The corresponding rate for academic/general education is 10.6 percent, which suggests an equal effect between VET and general secondary education (Nilsson, 2020). In this case, the empirical evidence shows that VET may have an impact on private and social growth, but the impact is not larger than general secondary education.

Nevertheless, it is argued that VET may have a positive impact on individual labor market vulnerability, especially when it comes to school to work transition, sector-specific skills development and the career flexibility of individuals (Korpi, 2003). In a study about the relationship between educational qualifications and various labor market outcomes in the school to

work transition based on the empirical evidence of 13 countries, Müller and Shavit (1998) found that even though the effects of education and training differ among different countries' institutional contexts, vocational education, in most of the countries, lowered the risk of unemployment for young people first entering labor market. Majority of VET institutions in African countries are established under a close partnership with the private sector, or more specifically, with companies where the trained labor is expected to end up at. VET curriculum, when designed scientifically according to the labor market demands, can equip individuals with skills specific to job requirements. Becker's human capital theory (1964) defines the distinction between sector-specific skills offered by VET and general skills offered in secondary education as: sector-specific skills are more relevant to a specific context, while general skills are more transferable between different context. Winkelmann (1996), in his study on employment in Germany, found that having completed an apprenticeship or a VET program significantly lower one's unemployment rate. Graduates of VET institutions are generally provided with recognized certificates which indicates the industry standards and the 'trainability'⁴ of the individuals. These certificates put individuals in a more favorable position in the job competition and increase individuals' job-to-job mobility. Hiring workers with desirable skills externally rather than training workers internally can enable companies to externalize the cost of human capital to some extent.

With the potential positive impact on individual labor market vulnerability being said, there is still ongoing debates about the long-term benefits of VET on labor market outcomes. For example, researchers find it hard to prove a correlation between a better development of earnings and VET (Korpi, 2003). In a research studying the wage effects of education in Germany and the U.S., Harhoff and Kane (1997) resulted the similar wage effects of education at two countries' different mobility patterns. This suggests that some outcome variables in return influence the impact of VET, and that the VET systems differ by specific economic and social contexts.

⁴ According to Korpi 2003, 'trainability' indicates the ease with which an individual is able to learn new skills;

1.3. A New Trend in Development Economics: Randomized Controlled Trials (RCTs) Introducing VET Intervention

An important boost for the transformation of development economics research was a certain creation and adoption of a more coherent microeconomic theoretical framework. Another important catalyst was the strong shift in other areas of economics towards empirical studies explicitly designed to credibly estimate causal relations (Nobel Prize, 2019). The 2019 Nobel Prize in economics was awarded to three researchers, Abhijit Banerjee, Esther Duflo, and Michael Kremer, for their “experimental approach to alleviating global poverty”, the one that has “transformed development economics.”⁵ Throughout the years, international organizations and NGOs have conducted several experiments measuring the impact of vocational training on employment amelioration within targeted countries. This design-based approach started among labor economists in the early 1990s. But unlike the original design-based approach, which relied largely on natural experiments, the new microeconomics development research relied largely on field experiments.

Randomized Controlled Trials (RCTs) is a method for assessing the causal impact of a certain intervention or program. RCTs gained momentum in the 2000s when more researchers and institutions started to design and implement experiments to answer causal questions in microeconomics (Muller, 2019). Estimating the impact of a program on an individual at a given time is impossible. However, it is possible to estimate the average impact of the program on a group of individuals by comparing them to a similar group of individuals who were not exposed to the program. By doing so, it minimizes the confounding factors and allows an instant comparative outcome for researchers and policy makers. By randomly assigning individuals to a treatment and a control group, the selection bias can be solved. When correctly designed and implemented, RCTs can allow researchers to estimate the causal impact of a certain intervention in an unbiased way, with a higher level of statistical probability. Another reason for RCTs to become one of most popular method for development economists is that, with

⁵ “Scientific Background: Understanding development and poverty alleviation”, Advanced information. NobelPrize.org. Nobel Prize Outreach AB 2022. Sun. 15 May 2022. <https://www.nobelprize.org/prizes/economic-sciences/2019/advanced-information/>

the a greater control, researchers are able to design the intervention through the use of multiple different structures and determine the exposure of the intervention (Gaille, 2020).

Out of all the treatments experimented in RCTs in the search for a better economic development, VET is becoming a more regular subject and an increasing number of VET interventions are taking place to establish finer relations with labor market outcomes, skills development, youth employability, etc..

The Abdul Latif Jameel Poverty Action Lab (J-PAL), a global research center, has carried out a number of interventions directed at vocational training. Between 2009 and 2013, researchers conducted a randomized evaluation to test the impact of a training program and its soft skills component on future expectations and labor market outcomes of youth in the Dominican Republic. The result shows that the training program had positive and lasting effects on skills acquisition and expectations for women, but finds that three years after the end of the program, any impacts on employment outcomes had dissipated for both genders (Acevedo, 2018). The paper examines a regression model established by researchers in their study for one of J-PAL's interventions in Uganda (Alfonsi et al., 2020). The researchers designed a labor market experiment to compare the policies from demand side and supply side to tackle youth unemployment, by observing the effects of vocational training (VT) and firm-provided training (FT) on 1714 workers and 1538 small and medium sized enterprises (SMEs). The experiment was carefully designed to make sure the sample workers are both randomized and below the country's average employment status for a clearer comparison. The study comes up with a sector-specific skills test and a job ladder model to better evaluate treatment effects on youth employment status. After comparing the treatment effect among the baseline, 24, 36 and 48 months after the intervention, the study finds that: (i) both VT and FT workers have gained sector-specific skills and significantly improved their employment rates, (ii) both VT and FT workers experience improvements in an index of labor outcomes, (iii) the treatment effects for VT workers materialize more slowly but last longer than they do for FT workers, and (iv) VT workers are easier to recertify their skills and find work again when unemployed, and have higher increase in annual earnings than FT workers (Alfonsi et al., 2020). This study well

reflects the advantages of RCTs in terms of identifying a more specific relation between the intended treatments and the outcomes, offering a clearer guidance for policy makers.

Apart from the practices of RCTs sponsored by research centers, academic institutions and NGOs, IOs have become increasingly interested in implementing RCTs as part of their international projects. ILO is, among other active players, has conducted a number of RCTs in Africa, Middle East and Latin America. For the purpose of evaluating the impact of skills training programs on Moroccan youth's financial behavior, employability and educational choices, ILO (2017) conducted the first RCT on evaluation of skills training program in Morocco. The intervention targets specifically young people (aged between 15 and 25) living in rural areas and offers the treatment group over 100 hours of trainings on primarily financial education, with additional courses on soft and entrepreneurial skills. Using RCT as a study method allows researchers establish causal relation between the intervention and individual indicator of representing the outcome evaluation. In this ILO study, for example, researchers find that the participants of the program are more likely to establish a saving account, and more likely to postpone their entry into the labor market.

Nevertheless, RCTs also has its share of drawback and limitation due to its nature. One possible drawback can happen when researchers use block randomization⁶ as their primary option to select participants, the allocation of participants has a risk of being predictable, which could lead to a limited amount of external validity. Most of RCTs require comprehensive and sometimes intricate designs to ensure the "randomization" and "control". And this will make overspending and applicability issues become more likely. In addition, RCTs, together with the observed outcomes, tend to face constraint or differ in the face of demographic, social, economic or cultural changes.

⁶ * A method to randomize select participants into groups that result in equal sample sizes to ensure a balance in sample size.

2. Research Background

2.1. Youth Employment in Sub-Saharan Africa and Morocco

The United Nations (UN) estimates that by 2035, Sub-Saharan Africa will have 295 million people between the ages of 15 and 24, and the number will grow to 362 million by 2050 (UN, 2011). This young and rapidly growing working age population means the region will constitute the world's largest reservoir of labor for generations to come. Between 2000 and 2012, Sub-Saharan Africa's GDP experienced an impressive 4.5 percent/year growth. About one-quarter of the countries in the region grew at 7 percent or better. However, this growth fails to translate to a proportionate poverty reduction in the region. Each 1 percent increase in average per capita consumption has been associated with a reduction in poverty of 0.69 percent; whereas in other regions of the world, the reduction has averaged just over 2 percent (World Bank, 2013).

Contrary to its demographic and economic situation, the unemployment rate in low-income Africa is only 3 percent. Is "unemployed youth" a legitimate concern? This low unemployment rate might seem counterintuitive, but it reflects how Africans simply need a job to survive. Where are Sub-Africans working then? Around 62 percent of the working-age population (ages 15-64) works on family farms. The second most popular sector is household enterprises, making up 22 percent of the labor force (See figure 1). These kinds of jobs, which mostly take in forms of small plot of land farming, harvest selling, or handcraft making, often involve the family only, leading to low earnings on average. Wage jobs, entailing wage services and wage industries where workers are paid a regular wage and benefits, only take up 16 percent of employment.

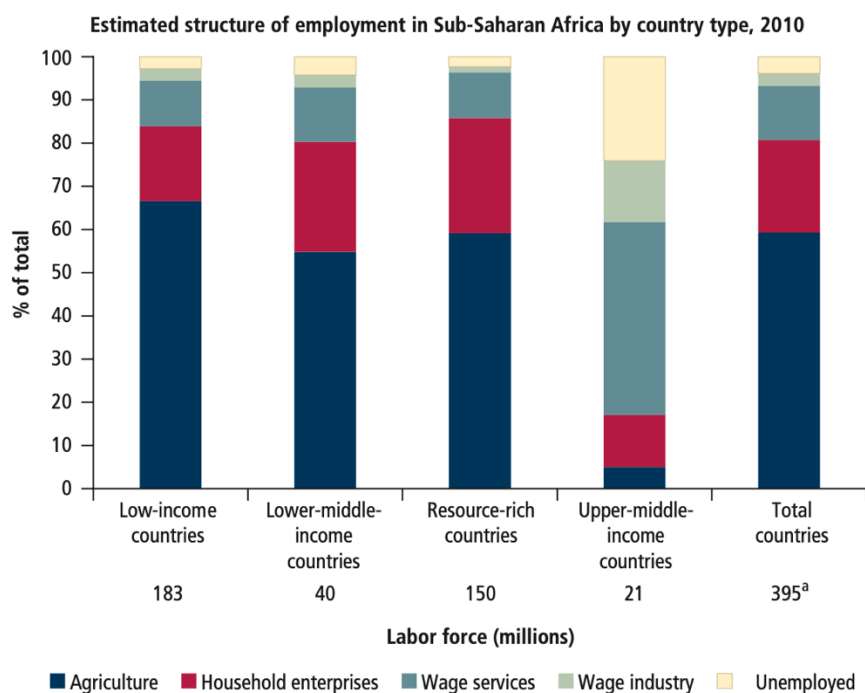


Figure 1: Africans Employment by Sector (World Bank, 2014)

A World Bank report (2014) predicted a strong growth for Africa's economy fueled by the continent's mineral and agricultural industries, with a rate of 5-6 percent a year. Increases in wage jobs is projected to come from continued diversification of output and exports and from increased domestic demand for services as incomes grow. Based on this assumption, together with the fact that service employment is normally the one that grows faster than in industrial sectors, the number of industrial sector wage and salary jobs is projected to increase 55 percent over the next 10 years. Growth as such that starts from a small base is incapable of accommodating millions of young people entering the labor force on a yearly bases. According to the projection, the share of industrial wage jobs in total employment will rise only from 3 to 4.5 percent in Sub-Saharan Africa, which rate is still below the average on in developing regions. Experts forecast that the existing employment structure will tend to persist for at least the next 10 years, which implies that at best, only one in four of Sub-Saharan Africa's youth will find a wage job, and only a small fraction of the employed youth will end up in formal jobs in modern enterprises, rather than in family farms and household enterprises like most young people in Africa find themselves to be employed by.

The above-mentioned condition explains the additional layer of the employment challenge faced by Sub-Saharan Africa – apart from creating more jobs in the formal sector, governments need to increase the productivity of the workforce, especially in informal sector. Raising the productivity of smallholder of farms and household enterprises will enable the formal sector to develop and thrive, which together will lead to structural transformation in Africa.

The transition from school to work, as well as between sectors of employment – between farming in family farms and a wage job, for example – is rather difficult for young Africans. Many of them lack the skills, means, or connection to translate their education into productive employment. According to a household and labor force survey conducted by the World Bank (2014), the transition from school to work in Sub-Saharan Africa is low, with many young people combining school with work for many years (See figure 2). What's more, young women are especially prone to be disadvantaged by other dimensions of the transition in comparison with young men. Social norms in Africa tend to enforce job segregation by gender. Young women are likely to be limited in certain fields such as textiles in the household enterprise sector.

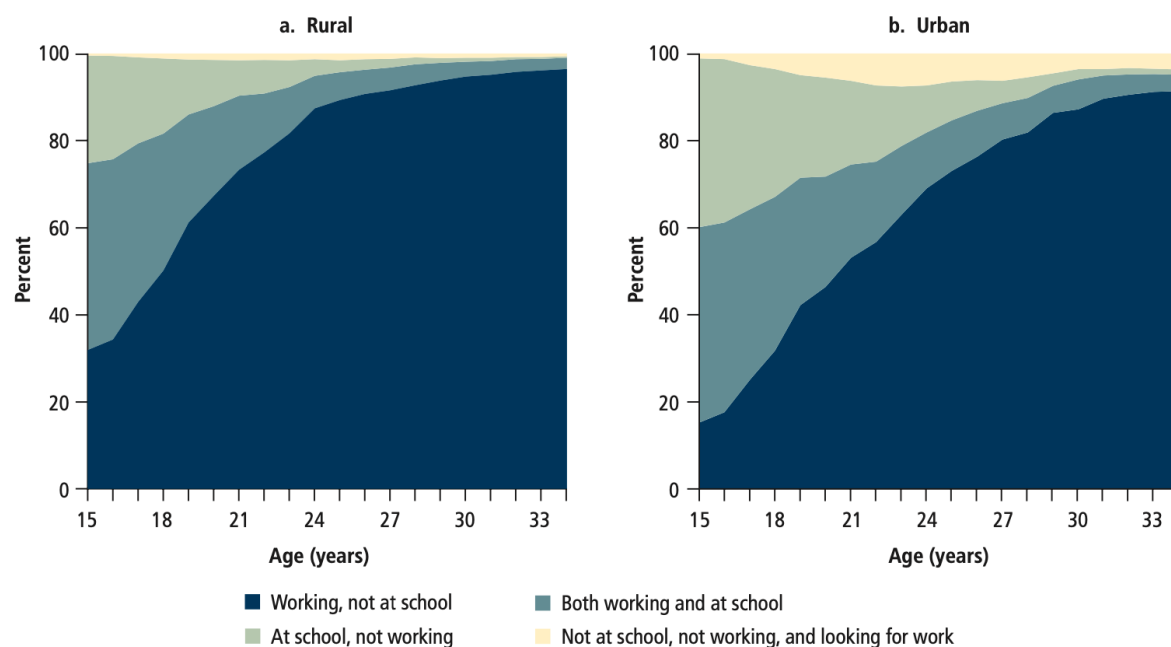


Figure 2: The transition from school to work in Sub-Saharan Africa (World Bank, 2014)

Morocco, a middle-income country, is also faced with employment challenges. In 2015, Morocco's GDP per capita was around \$7,800 (World Bank, 2016). Nevertheless, the country is struggling with slow job growth and low youth unemployment rate. According to a report from International Labor Office (ILO, 2017), as of 2015, 27 percent of Morocco's whole population is consisted of young people aged between 15 to 29. An increasing percentage this group are confronted with obstacles finding wage jobs as they transition from school to work. Morocco's labor demand is rather low, which has resulted in unsatisfactory labor market outcomes. This group experiences a substantial 19.3 percent unemployment rate, and over 90 percent of young women and approximately 40 percent of young men who are not in education are either out of the labor force or unemployed (World Bank, 2012). What's more, Morocco's youth labor market is characterized by regional disparities, where the difference in youth unemployment rate between urban areas (41 percent) and rural areas (21 percent) climbed up to 20 percent in 2012 (ILO, 2017). Recent decades, Morocco has been making efforts in reducing its dependence on agricultural sector and boosting its manufacturing industry. However, a low-skilled workforce, a low job creation and a low labor demand have put Morocco in the same struggle as Sub-Saharan African countries.

2.2. Current Practice and Policy Frameworks of VET

VET has gradually become a priority on the international development policy agenda. In September 2015, the United Nations (UN) makes quality education one of its 17 Sustainable Development Goals (SDGs) to ensure “inclusive and equitable quality education and promote lifelong opportunities for all.”⁷ International organizations (IOs) and public sectors have responded by strengthening and upgrading their VET systems, and VET has become the prime responsibility of Ministries of Education or Ministries of Labor/Employment/Social Affairs. Bilateral and multilateral donors have included VET on their agendas too. The promotion of social inclusion via VET is the underlying goal of the current global practice, which adds the social dimension to the consideration of VET's implementation objectives. With the global demographic developments and increasing youth unemployment in developing economies,

⁷ The 17 goals, United Nations Department of Economic and Social Affairs Sustainable Development, available at <https://sdgs.un.org/goals>, accessed in April 2022

the reasoning and criteria behind sustainable VET policies have become the center of international debate.

VET should be viewed from an institutional viewpoint as having to attain educational responsibilities and objectives while contributing to sustainable socio-economic development, functionally speaking (Wallenborn, 2008). Because VET implements not only policies put forward by different countries' ministries, but also policies recommended by the private sector, the actual implementation of the above-mentioned viewpoint is thus not as coherent. This diversity is also partially the outcome of existing social inequalities. In addition, both formal and informal VET should be considered, as the latter influences the informal learning process within the context of livelihood, which is supported by rural development (European Training Foundation, 2009). There is a need to outline the relevance of human capital formation in all of these different approaches to training in order to achieve sustainable development goals. Furthermore, VET reforms must be considered a precondition for the establishment of transnational economies capable of attracting foreign direct investment (FDI) through a proper human capital structure in developing economies (Miyamoto, 2003). The Asian Development Bank (ADB) called for the need for "a mental shift" from traditional VET approaches, which focuses on educational objectives alone, to "context-related world-of-work competences (ADB, 2008).

Since VET is a highly complex endeavor with diverse structures, and whose function is defined by different actors, different countries and IOs have gradually established their VET systems. Australian government, for example, came up with a 'VET Quality Framework' to achieve national consistency in registering and monitoring registered training organizations and in the enforcement of standards in VET sectors.⁸ This system puts great focus on the standardization and outcomes. On 1 July 2020, the European Commission made skills and VET the focus for its COVID-19 recovery agenda in the fields of employment and social policy, by supporting partnerships for skills, upskilling and reskilling and empowering lifelong learning.⁹ On 24

⁸ "VET Quality Framework", Australian Government, Australian Skills Quality Authority, accessed April 2022, <https://www.asqa.gov.au/about/asqa-overview/key-legislation/vet-quality-framework>

⁹ EU Policy in the field of vocational education and training, European Commission, accessed April 2022, <https://education.ec.europa.eu/eu-policy-in-the-field-of-vocational-education-and-training>

November 2020, the Council of the European Union adopted a Recommendation on vocational education and training for sustainable competitiveness, social fairness and resilience. The recommendation focuses on a more swift adaptation to labor market for the curriculum and an increased flexibility of the training methods.¹⁰ EU VET system leans towards a cooperative approach towards the education system and the labor market, and merges the distinction between VET and further education. The policy framework for the U.S., though varies from state to state, incorporate private sectors as training providers deeply in the system. The private training institutions are “leveraging faculty with industry expertise from corporate training institutes and from massive open online courses.”¹¹

Wallenborn (2010) discussed the structural problems, which hinder the effectiveness and efficiency of high quality VET programs, faced by most of the EU partner countries. He categorized the problems into three areas: *i) for both formal and non-formal VET, there is an inconsistent policy framework and a lack of management and decentralization policies; ii) poor VET performance manifested in low quality training, poor labor market relevance, inadequate organizational competencies, and difficulties to innovate (Fretwell & Wheeler, 2001); iii) sub-standard performance of trainers and teachers and ineffectual planning and management (BMZ, 2006).* Wallenborn hence emphasized the need for an analysis to distinguish the problem areas so as to understand and improve the systems ahead of the interventions, as well as aiding to the perspective of international partnership and the design of VET programs.

There has also been a greater effort to cultivate an effective VET system in Africa. The system is mostly constructed by IOs, non-profit organizations (NGOs) and intergovernmental organizations to explore the application of different theoretical innovations and practical approaches. A joint skills development project, VET Africa 4.0, by NGOs and academia thinks that VET policy and practice in Africa have experienced three post-independence phases, which can be categorized into modernization, basic needs and neoliberalism developmental

¹⁰ Council Recommendation of 24 November 2020 on vocational education and training for sustainable competitiveness, social fairness and resilience, Official Journal of the European Union, accessed April 2022, <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1606987593071&uri=CELEX%3A32020H1202%2801%29>

¹¹ Technavio (2016a) Technical and Vocational Education Market in North America 2016–2020. Sample. Infinity Research Limited

orthodoxies (McGrath, 2019). The project aims to draw together the useful components of the orthodoxies and come up with potential new approaches for skills development. The African Union drafted the 'Strategy to Revitalize Technical and Vocational Education and Training (TVET) in Africa' to recognize the critical role TVET plays in national development and to revitalize and modernize TVET in Africa so as to transform it into mainstream activity for African youth (African Union, 2007). The pace in developing innovative VET policies in Africa, Middle East, Central Asia and Latin America, however, is rather slow. There are four factors (Wallenborn, 2010) responsible for the circumstance: *i) scarce public resources and different political/development priorities; ii) a stagnant economy creates little incentive for VET reform; iii) a weak private sector incapable of pressuring policy makers; iv) a lack of strategic vision combined with a lack of reform and poor innovation, despite the best practices showcased by other countries.*

VET systems are complicated frameworks that can't be fully understood by focusing on internal efficiency, especially while reforms are in the works. Other systems, such as general education, the labor market, the world of work, and the economic systems, have multi-functional interrelationships with these VET systems. These complicated relationships do not work under simple input-output mechanisms, and they also imply uncertainties (Wallenborn, 2008). Reform interventions must account for this complexity by including emergence concepts (Mason, 2009), which can encourage systemic solutions that cannot be planned or recognized by looking at individual elements of the existing system (Luhmann, 1993).

3. Evaluation of VET

In order to yield better outcome of VET, it is important to build a well-grounded framework of VET evaluation. The benefit of VET evaluation not only lies in improving the equality of programs for a more profound impact on people's employment, but also in creating better understanding to stimulate debate and cooperation. VET evaluation is considered the premises of an effective and sustainable solution. Nevertheless, it is vital to address the constraints in the process of designing a comprehensive VET evaluation. According to Fretwell (2003), there exist a few assumptions depicting the challenge: i) the measurement of training efforts, especially when it is short term, is difficult; ii) common knowledge and standard is not available when it comes to information collection; iii) there is a considerable amount of limitation in effectiveness of one VET program for it is greatly contextual; iv) measurements is more possible in financial and production areas; v) the impact of VET is greatly affected by a large number of other variables to be precisely evaluated; and vi) VET personnel only makes a small proportion of an entity whose existence does not require justification, hence a less streamlined organization of work. All of the assumptions mentioned above has certain grounding in real life, however, it is also crucial to address the fact that some of the assumptions have been effectively dealt with in different settings. One should also acknowledge that VET, especially in developing countries, is competing for limited public resources, and that providing fundings for VET programs in IOs and NGOs has yet to become a priority for developed economies. This circumstance has added another dimension to the importance of a reliable VET evaluation to ensure a well-functioned VET program under minimum levels of resources and financing.

3.1. Evaluation Approaches and Measures

To determine the approaches for VET evaluation, one should be able to, first and foremost, pinpoint the objectives of VET. Based on various studies on the primary functions of VET, it is reasonable to view the objectives under economic and social lenses. Even though the most immediate objective of VET is often considered under an economic perspective, VET's influence in solving society's issues and predicament is gaining more attention. The social nature of the VET goals lies in poverty reduction, improvement of gender equality and social cohesion, reduction in crime rate and unemployment rate, contributing to the achievement of SDGs. The economic objectives of VET is more straightforward: a better employment for a

more sustainable labor market, improvement in wages and distribution of wealth, reduction in social expenditure, a better allocation of public resources, leading to a more productive and healthy market.

Fretwell (2003) put forward a system of evaluation approaches which examines the internal inputs and external outputs of a VET program. Internal inputs inspect the VET from within, starting from the program's curriculum and materials, the trainers' qualifications, the program provider's – normally a specialized VET institution – facilities and equipment, to the responsibilities of the VET personnel, namely the design of the policy and program, the execution and management of a program, a functioning evaluation and supervision system, and a platform to gather stakeholder's input. The evaluation of the internal inputs of a program does not stop at the examination of the level of representation and the quality of the above-mentioned areas of input, but requires an assessment of to which extent the inputs are utilized efficiently. Efficiency under this context can manifest in either better training outcomes or less training costs, holding the rest variables constant. The accessibility of official administrative data is essential for the measurement of internal inputs of VET and it often constitutes the main obstacle for an effective evaluation system, which is especially the case for VET programs located in developing areas under the category of international development assistance. A detailed administrative data generated from a close and constant monitor and supervision of the VET program requires a close relation with the hosting government and technical support for the setup of the data collection system.

External outputs reflect the objectives of VET that covers the intended social and economic benefits of a program. The empirical research studying the economic impacts of VET over the past decades presents a relative reliable evidence on the benefits on human capital investment. Since the incentive of such investment depends greatly on the demographic trends and economic policies of one government, as well as the economic trends and strategies in a global context, the measurement of the external economic outputs requires more attention as the priorities of the social and economic goals of the implementation of VET differs by governments, organizations, and programs. To a certain extent, the quantification of the social impact of the external outputs is more difficult, because the changes on the social level

often manifest in long-term outcomes and are inter-connected with other social factors by nature, leading to an insufficient evidence for precise identification and attribution of factors per outcome. Fretwell (2000) proposed two approaches when it comes external outcome evaluation. He differentiate the “gross impact” and “net impact”¹² of the social and economic outcomes, with the former identifying and examining the “performance indicators” based on the objectives of VET programs, and the latter setting up a controlled group and comparing the relevant indicators with the outcomes of VET programs (similar concept as the objective of RCTs). Asnussen (1996) came up with three evaluation methods for the economic outcome. The first one is “*growth accounting studies*”,¹³ which attributes the main driver for economic growth to increased labor and capital inputs, with education being the most important factor. The second method is “*productivity studies*”,¹⁴ which examines the direct relationship between workers’ physical productivity and additional education they are given. The third one, “*rate of return*”,¹⁵ compares the net cost of offering different types of trainings with the long term net returns of each program on a systematic level.

3.2. Key Competences Standards

In the design and evaluation of VET programs, more reference has been made upon the program’s ability in equipping trainees with key competences for modern economy employment. To achieve a more profound social impact, a well-designed and -managed VET program should build their curriculum with the consideration of the key competence standards. Several IOs have outlined the key competences standard as the guideline of their VET and skills development programs. Two versions of the standard are rather representative.

The first one is recommended by the European Parliament and the Council (Meseşan and Albulescu, 2020) for the reference through the education process, to ensure “a unitary framework for young people training, with a view on efficient social and professional inclusion.”¹⁶

¹² Fretwell, D. (2000) Educating the Impact of Active Labor Programs (Washington D.C., World Bank)

¹³ Asmussen, N (1996) Training, Development, and Education (Bang and Olufsen)

¹⁴ ibis

¹⁵ ibis

¹⁶ Meseşan, N., & Albulescu, I. (2020). Role Of Key Competences In Preparing Young People For The Labour Market. In & V. Chis (Ed.), Education, Reflection, Development – ERD 2019, vol 85. European Proceedings of Social and Behavioural Sciences (pp. 677-684). European Publisher. <https://doi.org/10.15405/epsbs.2020.06.70>

According to the Recommendation of the European Parliament and of the Council (2006), the formulation of the key competences is a bid to provide a “European benchmark for policy makers, education providers, employers and pupils”¹⁷ for common objectives pursued by both national and international efforts. The key competences are listed as follows (European Parliament & the Council, 2006): *1) communicating in a mother tongue; 2) communicating in a foreign language; 3) mathematical, scientific and technological competence; 4) digital competence; 5) learning to learn; 6) social and civic competences; 7) sense of initiative and entrepreneurship; and 8) cultural awareness and expression.*

With an aim of increasing labor mobility and addressing the needs for skills recognition and improving training system, International Labour Organization (ILO) introduced the Regional Model Competency Standards (RMCS) as the reference standards at the regional level to “underpin efficient and effective”¹⁸ skills development training programs. Similar to the competence standard proposed by the European Parliament and of the Council of European Union, the RMCS were developed as a reference for policy making, curriculum designing, recruiting and beyond. According to ILO (2015), competencies can be considered “core” when they: *1) are able to be learned and be assessable; 2) are essential to preparation for employment; 3) are core to the kinds of work and work organization in a range of entry level occupations, rather than being occupation- or industry-specific; 4) equip individuals to participate effectively in a wide range of social settings, including workplaces and adult life more generally; and 5) involve the application of knowledge and skills.* The summary of the core units of competency is available at the Appendix.

¹⁷ The European Parliament and the Council of European Union (2006), Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning (2006/962/EC), from <http://data.europa.eu/eli/reco/2006/962/oj>

¹⁸ International Labour Organisation (2015). Regional Model Competency Standards: Core Competencies. Regional Skills Programme. Regional Office for Asia and the Pacific, from https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/publication/wcms_420961.pdf

4. UNIDO's VET Projects

Since 2012, the United Nations Industrial Development Organization (UNIDO), together with different public, private and development partners, has implemented its VET strategy in the form of twelve public private development projects (PPDPs) to support skills development for young people in eight countries: Ethiopia, Iraq, Liberia, Morocco, South Africa, Uganda, Uruguay and Zambia (Alba, Stucki, 2021). The PPDPs focused on heavy duty equipment and commercial vehicle training, as well as forestry skills development, to address the market failure caused by the mismatch between demand and supply of highly skilled labor in the targeted sector. With these projects, UNIDO aims to improve youth employment situation, enhance business environment and contribute to poverty reduction, ultimately contributing to the 2030 Sustainable Development Agenda by addressing issues related to the Sustainable Development Goals (SDG) in inclusive and quality education, full and productive employment, decent work, industry and global partnerships.¹⁹

Supported by the Swedish International Development Agency, UNIDO's Learning and Knowledge Development Facility (LKDF) provides policymakers and development practitioners with a platform to share and bring forward practices and experience in the area of industrial skills development and VET strategies. For instance, the Facility's PPDP project in Addis Ababa, Ethiopia, intervened and upgraded the local VET institution, and offers 36-month heavy-duty equipment and commercial vehicles training courses to 25 to 40 students per year. It develops and incorporates the sector specific skills that are in demands with the support from Volvo Group. And together with the assistance of the local government, students are able to enjoy a combination of theoretical training and hands-on practice. According to the analysis of the project data from the years of 2012, 2013 and 2014, the number of female participants jumped from 3.8 percent in 2012 to 57.6 percent in 2014. A little less than two thirds of the trained workers reported full-time employment after the training and majority

¹⁹ SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all; SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all; SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation; SDG 17: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.

of them claimed to have their salary increased (UNIDO, 2019a). Similar practice has been found in Liberia, where local VET center is strengthened under the partnership of the Governments of Japan and Liberia, Komatsu Ltd, and UNIDO. Interestingly, according to the available data recorded in 2016, less half of the trained workers found employment (including self-employment) after the training, while 94.6 percent of the workers said they would recommend the trainings to others (Virpi, 2021). This contrast between labor market outcome and individual satisfaction might be stemmed from a poor overall labor market environment in the country due to the civil wars and Ebola.

For this paper, we focus on three of LKDF's PPDPs, H2O Maghreb (Morocco), AGEVEC (Morocco), and ZAMITA (Zambia). Individuals took part in the projects gained information to the training mainly via two means: family/friends' introduction, and/or promotion campaigns by organizing partners. Trainees are from Zambia, Cote d'Ivoire, Senegal – Sub-African countries – and Morocco. The trainings, generally last six months, are free of charge.

4.1. Design and Setting

AGEVEC, Morocco, Ivory Coast and Senegal (2015 – 2018)

As mentioned previously, the economic growth Morocco has been experiencing in recent years does not translate to a healthy labor market. One of many issues the labor market faces is the mismatch between the supply and demand of skilled workers in industrial sectors. Morocco's existing VET system has fallen short of meeting the needs of the private sector. Meanwhile, prevailing youth unemployment puts young people and the safety of communities in jeopardy.

The Heavy Duty Equipment and Commercial Vehicles Academy (AGEVEC in French) is a PPDP operated by UNIDO, Moroccan Ministry of National Education and Vocational Training, Office of Vocational Training and Employment Promotion, National Construction and Public Works Federation, the Volvo Group, USAID, OCP foundation, in a bid to address the youth unemployment issue by administering a technical vocational training program combining theoretical learning with internships at the partner private companies. Starting from 2016, each year

the Academy enrolls and trains 150 Moroccan, Ivorian and Senegalese youths in heavy duty equipment maintenance. It developed new curriculum modules and introduced staff development plan for conducting skills upgrading for all trainers in teaching methodologies and technical skills. The project puts great emphasis on practical training. Students are introduced to internships or apprenticeships and career service points are established to assist students with the school to work transition (UNIDO, 2017a).

H2O Maghreb, Morocco (2017 – 2022)

Morocco faces challenges caused by scarce water resources and high water demand. Similar to neighboring countries, Morocco has made sustainably developing and managing its water resources one of the government's priorities. To address the challenges of unsustainable water management, the H2O Maghreb project focuses on tackling the following issues: a lack of knowledge and information on employment environment and skills mismatch, a lack of professionals equipped with sector-specific skills related to water management technologies, and a lack of learning from the best practices.

In order to fulfill the above-mentioned objectives, this project uses and promotes innovative techniques through the implementation of a new training program dedicated to water management and sanitation. The H2O Maghreb curriculum, which was recently developed, takes a comprehensive approach, combining academic knowledge with hands-on experience using the most cutting-edge technical advancements, such as adaptive virtual reality and automation technologies. The training is practice-oriented, where expertise and modern technologies, together with water management experts, are transferred, so as to better water management practices for an increased employability of young Moroccan and improved skills for the experts. The project established a fully equipped training hub inside of the existing VET center in Rabat, and developed 23 training modules on wastewater treatment, operation and maintenance of water facilities after receiving national accreditations for the modules (UNIDO, 2017b).

The National Strategy for Vocational Training for the period 2015-2021, as well as the Vocational Training Vision 2020, oversee Morocco's technical and vocational education and training policies (UNESCO-UNEVOC, 2015). These strategic documents advocate for closer

collaboration with chambers of commerce, enterprises, and professional organizations. In addition, the King called for a "thorough review of vocational training programs to align them with the needs of businesses and the public sector, and to ensure that they are adapted to changes in industry and trades in general, thereby increasing the chances of graduates accessing professional life" in his Royal Speech on the 65th Anniversary of the Revolution of the King and the People (Kingdom of Morocco, 2018).

ZAMITA, Zambia (2015 – 2019, 2019 – 2022)

As one of the youngest countries in Africa, 36.7 percent (4.8 million) of the whole Zambian population is aged between 15 to 35 years old. Like Morocco and other Sub-Saharan African countries, youth unemployment is one of the most urgent task to conquer. As a result, the Zambian government established its National Development Plan for 2017-2021 to create one million jobs in critical industries over the next five years. The extractive, infrastructure, and transportation industries, along with agriculture, are the largest employment opportunities. The Zambian Industrial Training Academy (ZAMITA) was founded to support the government's efforts to increase young employment in vital areas. By supporting systemic change in the creation of a trained workforce, this academy will benefit the transportation and heavy equipment industries. In 2016, ZAMITA developed a center of excellence for the upskilling of the workers in heavy equipment on maintenance and operation, preparing the workforce for the country's booming mining industry and other affected or derivative industries. It was designed as a pilot project to demonstrate the effectiveness of the PPDP model in bringing forward systematic change within the VET system and labor market. ZAMITA, like the previous two projects, was also established within the already existing VET school, the Northern Technical College. ZAMITA also works closely with the private sector to ensure a constant and stable supply of internship, employment opportunities or career advice seminars. The local government, represented by the Ministry of Higher Education supported the project with bursaries for 263 students in a partnership with the African Development Bank (UNIDO, 2019b).

The 7th National Development Plan, including its Implementation Plan, the Technical and Vocational Education and Training Policy from 1996, and the Vision 2030 plan oversee Zambia's training provision. The role of technical and vocational education and training in economic development is emphasized in both the Policy and the Vision documents (UNESCO-UNEVOC,

2010). The 7th National Development Plan calls for a paradigm shift and the building of "an environment that promotes significant private sector participation in the socioeconomic development process." The 7th National Development Plan also encourages private sector participation in all areas and economic diversification. The Plan acknowledges that "private education and training providers will continue to be significant partners in the delivery of education and training for everyone at all levels" in terms of skills. Furthermore, the Plan states that courses would be updated on a regular basis to meet global market skills requirements (Virpi, 2022).

4.2. Data Collection and Evaluation

The primary instruments used in this study for data collection are a baseline and an endline survey – the access of which was provided by the project manager of the LKDF team at UNIDO. In the year 2017 and 2019, the LKDF conducted a baseline survey and an endline survey respectively at the trainees of the above-mentioned three projects, one prior to the start of trainings and one two years after the training (Survey questions see Appendix). During both data collection process, no incentives were offered to the participants. The baseline survey was conducted at the training centers with the staff on the field for observation and supervision. Trainees were asked to arrive at pre-arranged times with staff going through the survey with each of the participant in English. The endline survey, which took place two years after the interviewed trainees graduated from the program, was sent out to the registered email addresses. Those who failed to respond to the first endline survey were sent another email reminder seven days after. The staff later on compiled the survey results and stored the data set on a data collection tool named KoboToolbox.

Information about the participants gathered from the survey questions, apart from those that are demographically related, include their course names, highest diplomas, financial obligations, living situations, numbers of children, vocational training histories, current salaries, expected salaries, job situations, industry sectors, etc.

Baseline survey managed to register 1061 units of data. Endline only managed to collect data from 469 entries, resulted from drop-out rates due to personal matters and low compliance rate for the endline survey. There are a number of participants who have submitted more than once in both baseline and endline. After filtering the datasets, checking and dropping duplicates (the most recent entries are kept during the process), and after cleaning the data for entry errors and incomplete responses, there are 275 eligible candidates remained for a baseline-endline comparison.

In order to have a better understanding of the characteristic of the participants, Table 1 presents the baseline values for the available background variables, including age, gender, education level, number of residence, number of children, and history of VET participation. As Table 5.1. shows, the participants were, on average, in their later stage of youth, and less than 30 percent of them were female. High school degree and technical diploma are the two common education backgrounds of the participants. Majority of the participants lived either with their family or in a shared residency with the average number of persons living with the participants being five. Around 10 percent of the participants have children. 47 percent of them have had experience being trained at VET projects. While 38 percent of the participants had worked in the last month, only 13 percent of them had done a wage employment where they received any forms of payment.

Table 5.1. Background variables at baseline combined, sample (N=275)

Age	Gender (1=Female)	Education Level	Number of Resi- dence	Children (1=YES)	Previous Training Courses	Has Worked in the Last Month	Has Done Wage Employ- ment in the Last Month
24.176	0.276	1.687	5.432	0.095	0.469	0.383	0.130

Note: Recorded is the mean of all observations. Education level is calculated following: High School = 1, Technical Diploma = 2, Bachelor's degree = 3.

When comparing the sample group with the overall youth population in Sub Saharan Africa and Morocco using a compiled data report from the World Bank (2014 and 2021), we find

that our sample is older – those aged between 22 to 25 are more represented in the study. The average female population in Sub Saharan Africa and Morocco is 51 percent, while the female represented in the sample group is 25 percent less. Despite the fact that they sample group is older than the population presented in the World Bank data, more of them were in a form of education rather than in a form of employment, and more of them had VET experience. The labor force participation rate for Sub Saharan African youth is above 50 percent, higher than that of the sample group. According to an youth VET profile published by UNESCO-UNEVOC (2019), 8 percent of Moroccan youth are enrolled in VET projects. The number of youth who have had VET experience in Sub Saharan Africa and Morocco only takes up a small fraction of the whole population. In conclusion, the participants of the three UNIDO VET projects are not representative of the regions' youth population.

4.3. Results and Limitations

According to the analysis of the job situation comparison, more than half (54.73 percent) of the participants felt a better employment after the trainings, 2.88 percent of them felt a worse employment, and 18.93 percent of them could not feel the change. When job situation comparison is viewed under gender lenses, 80 percent of surveyed female noticed a better and easier employment, while for surveyed male the percentage is 67 percent. The overall satisfaction of their job situation after trainings for all four nationalities (Ivorians, Moroccan, Senegalese, Zambian) is above 60 percent, with Senegalese being the most satisfied with their job situation (86 percent found it being better) (See Figure 3, Figure 4, Figure 5).

How many people are earning more after the trainings? 37 percent admitted an increase in their salaries after the trainings, 25 percent noticed no change in their earnings, while there were 6 percent of the participants claimed that their earnings decreased. The rest of the participants did not respond. When it comes to gender, almost 93 percent of the female witnessed their income either increased or stayed the same, and 84 percent of the male experienced the same (See Figure 6, Figure 7).

During the baseline survey, 74 percent of the participants described their financial situation as “not enough to sustain myself”. According to the information from the endline survey, this

ratio dropped to 48 percent (See Figure 8). 82 percent of the remaining 48 percent of the participants who struggled to sustain themselves even after the training had other financial responsibilities and people they were supposed to be supporting.

From the baseline-endline comparison, we see a positive impact of the VET projects on participants' job situation, where female participants enjoy a better and more noticeable improvement in their employment situation. However, the monthly earnings did not improve significantly for most of the participants. Female participants, again, felt the positive impact of VET projects on their monthly earnings more profoundly than male participants. What's more, the 6-month training projects did not enhance the financial situation of the majority of the participants. This result does not seem illogical since even though more participants were employed after the trainings, their income level did not enjoy a substantial boost.

Due to the absence of a control group in the available sample for UNIDO's VET projects, we are not able to estimate the treatment effects of the overall trainings on labor market outcome. We might be able to gain some insight of the likely treatment effects estimated by available studies. In their research, mentioned in the Literature Review on impacts of training on youth unemployment in Uganda, Alfonso (2020), concludes a 21 percent impacts on improved employment probabilities for relatively disadvantaged youth in the treatment group compared with the ones in the control group, and the ITT earnings impact is an increase of 25 percent over controls. Similar results are observed by Bassi (2021) in their six-year field experiment in Uganda evaluating the impacts of labor market interventions on individuals' job prospects and the long-term labor market outcome. During the interventions, training was offered in Uganda's booming manufacture and service sectors with high quality firms. Researchers selected unskilled but motivated youth VET has, in the long run, a 34 percent impact on an improved employment index. There are also a few studies that could not determine the treatment effects. The study mentioned previously based on ILO's RCT on the impact of skills development on Moroccan youth's financial situation measures, after the impact estimates on financial behaviors, the impact estimates on employment outcomes represented by six labor market-related outcomes variables, namely individual being employed, being unemployed, being inactive, being NEET (not in education, employment or training), work

experience in between the baseline and endline surveys. Researchers fail to find a statistically significant impact for four out of six variables. The researchers consider the cause of the result being the counter-effect of the participants' labor market outcomes and educational outcomes, which is not recorded in the impact estimates on the labor market outcomes.

This explains one of the scenarios when the treatment effects of VET on labor market outcomes differ greatly. When the participation selection is designed to examine a specific correlation, mostly in RCTs, the external validity and the examination of a less relevant correlation face the risk of being compromised. Besides, McKenzie (2017) found that in the setting takes place in low-income countries, when it comes to meta-analysis of training interventions, most interventions have a very low internal rate of return (IRR), due to the absence of an effectively and efficiently functioning market and financial system, pronging long, if not obscuring, the impacts manifestation period. Apart from being affected by the design of the intervention and the economic and social settings where the intervention took place, the outcomes of the evaluation of treatment effects can be influenced by the sample selection. Alfonsi's (2020) estimated impacts of treatment effects is relatively larger in comparison to previous studies²⁰ with the similar design and setting.

4.4. Treatment Results Comparison among Projects

Even though we are unable to measure the impact of treatment effects thus unable to prove a valid and unbiased causal relation between the VET projects and improved youth employment situation, we could compare the characteristics, participants background variables and results of treatments among the three projects to discuss possible connections for the reference of future VET program design, management and evaluation.

First we compare the results of indicators of labor market outcomes between AGEVEC and ZAMITA to discuss the influence of external factors on the effectiveness of VET projects, with the consideration of the non-representative nature of the participants sample. Two projects share an important list of similarities: both offer trainings on heavy duty machinery and

²⁰ Attanasio, Kugler, and Meghir (2011) observed a 7% increase in women's employment rates, while Card et al. (2011) found no evidence of the impact of treatment effects.

commercial vehicles, offer industry recognized certificates after trainings, have updated the curriculum based on the recommendations for the partner from the private sector, the Volvo Group, and both engage students in undertaking apprenticeships. Together with the fact that both projects are under the management of UNIDO's LKDF, though having different project managers, the execution and management of the projects shouldn't vary too much. Additionally, Zambia and Morocco have similar youth unemployment rate, even though Zambia's economic growth is significantly slower and the country's poverty headcount ratio is six times higher (World Bank). Apart from the difference in economies, two countries have different industry sector structure. Moroccan industrial sectors is more diverse with an advantage in automotive and service sector, while Zambia's economy has historically been based on copper mining industry. Participants profiles for the two projects differ in three variables indicating the educational and employment background of the participants (See Table 5.2.). Participants in AGEVEC are 76 percent better educated than ZAMITA participants, with majority of the group hold at least a Technical Diploma. 30 percent more AGEVEC participants have had employment recently, while the relevant percentage of participants who did not receive payment for their work is the same for both projects' participants, suggesting a common employment situation shared by the groups of participants.

Table 5.2. Background variables at baseline, ZAMITA vs. AGEVEC

	N.	Age	Gender (1=Female)	Education Level	Number of Residence	Children (1=YES)	Previous Training Courses	Has Worked in the Last Month	Has Done Wage Employment in the Last Month
ZAMITA	126	24.006	0.215	1.309	4.509	0.14	0.452	0.245	0.055
AGEVEC	96	25.421	0.132	2.314	4.802	0.051	0.448	0.572	0.394

Note: Recorded is the mean of all observations. Education level is calculated following: High School = 1, Technical Diploma = 2, Bachelor's degree = 3.

Table 5.3. shows the percentages of participants who experienced positive treatment results of an improved employment situation. The VET program has made a positive and relative

profound impact on the overall employment situation for the AGEVEC participants, while the positive impact is felt by fewer ZAMITA participants. However, the number of ZAMITA participants who witnessed an increased earning is far from insignificant, which implies a rather substantial positive effect of training on their industry skills and employment profile. One likely factor leading to their low employment improvement could be the low labor demand in Zambian transportation and automobile sectors.

Table 5.3. Labor market outcomes indicators, ZAMITA vs. AGEVEC

	Better Employment	Increased Earning	Self-sustainable Financially %
ZAMITA	0.176	0.312	0.151
AGEVEC	0.674	0.483	0.406

To observe the impact of projects' internal factors and participants characteristics on the depth of VET's influence the labor market outcome variables, we will move on to the comparison between AGEVEC and H2O Maghreb. The most apparent difference in terms of the program design is that H2O Maghreb is a technical vocational education and training (TVET) project. Unlike AGEVEC providing mechanic trainings on the country's main industry sector, H2O Maghreb implements a technological approach to improve water management practices and skills development. Though both belonged to UNIDO, the projects are managed by different divisions, with H2O Maghreb being more active in outreach advocacy. Almost 70 percent of H2O Maghreb participants are female and are 14 percent better educated. Their baseline employment situation is immensely worse than AGEVEC participants, despite having the similar background variables.

Table 5.3. Background variables at baseline, H2O Maghreb vs. AGEVEC

	N.	Age	Gender (1=Female)	Educa- tion Level	Num- ber of Resi- dence	Chil- dren (1=YES)	Previ- ous Training Courses	Has Worked in the Last Month	Has Done Wage Employ- ment in
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									the Last Month
H2O Ma- ghreb	53	25.006	0.679	2.648	6.367	0.000	0.528	0.169	0.151
AGEVEC	96	25.421	0.132	2.314	4.802	0.051	0.448	0.572	0.394

Note: Recorded is the mean of all observations. Education level is calculated following: High School = 1, Technical Diploma = 2, Bachelor's degree = 3.

Trainings of both projects left participants a noticeable positive impact on their labor market outcome indicators, which is especially the case for H2O Maghreb participants when asked to compare their current job situation. 80 percent of the participants find their job situation improved, when before the training, only less than 20 percent of them were employed. This result does not only imply a vibrant labor market in search of technological talents in water resource management, but also imply VET/TVET's potential in improving the employment situation and the livelihoods of vulnerable communities.

Table 5.4. Labor market outcomes indicators, H2O Maghreb vs. AGEVEC

	Better Job Situation	Increased Earning %	Self-sustainable Financially %
H2O Ma- ghreb	0.811	0.439	0.396
AGEVEC	0.674	0.483	0.406

4.5. UNIDO VET Projects Evaluation

The evaluation of the projects will inspect their internal and external outputs, combined with the consideration of whether the projects are beneficial for developing participants' key competences. Due to the restricted access to relevant resources and partial understanding of the projects – which is mostly based on a no- representative small participants sample, this evaluation is limited.

Before looking into the projects outputs, the objectives of the projects need to be identified, for it gives the direction and priorities for our evaluation. UNIDO is a specialized UN agency

that promotes industrial development for “poverty reduction, inclusive globalization and environmental sustainability”.²¹ The objective of UNIDO’s LKDF, the platform that initiates, implements and manages the above-discussed three VET projects, is to promote skills development among young people in developing economies. LKDF supports the “establishment and upgrading of local industrial training academies”²² to address skills mismatch in labor market through VET projects developed under PPDP. LKDF’s focus on skills development also ensures that in the design of the projects, due attention is paid on life-long learning and soft skills. The objective of the three programs in this paper, like other VET projects implemented by IOs, puts substantial emphasis on the social implications and benefits. On the one hand, this social impact – oriented objective spares the VET program from being manipulated for personal gains, while allows VET to reach the areas, communities and people in need. On the other hand, it is prone to certain setbacks, mostly manifested on the internal outputs.

The overall design of the projects are satisfactory, which reflects in the positive impact the trainings had on participants’ employment situation. All three of the projects were established under a partnership among LKDF (UNIDO), the private sector, a development agency of a third country, and the government of the host country. This gives the projects a smooth start: fundings from the development agency, assistance to curriculum design and apprenticeship opportunities from the private sector, facilities and equipment at the training institutes organized by the local government, and a guideline for an enhanced skills development and youth employment compiled by UNIDO. One aspect of the program design, however, requires better attention. The comparison between AGEVEC and H2O Maghreb highlights the importance of incorporating elements that are at the core of 4th Industrial Revolution, and of targeting vulnerable groups for a sustainable and inclusive development for an effective VET program. In comparison, ZAMITA’s training targeting a less competitive sector under backdrop of an overall constraint domestic market making its participants the least likely to benefit. Another contradicting fact is the design of targeted trainee group. The objective of the

²¹ United Nations Industrial Development Organization (1979). Constitution of the United Nations Industrial Development Organization. Official document, from https://www.unido.org/sites/default/files/2009-07/UNIDO_Constitution_0.pdf

²² The Learning and Knowledge Facility (2015). LKD Facility: a partnership approach to industrial skills development. Official document, from https://lkdfacility.org/wp-content/uploads/LKDF-Brochure_Print-April-2015.pdf

program is to promote skills development for young people (age 15-25). However, participants aged over 30 are found in the sample data, in which the average age of the participants is 24,176. Besides, the female participation rate in AGEVEC and ZAMITA is astonishingly unproportionally low, contrary to the organization agenda for social inclusion. Of course this observation is not well-grounded for it only bases on a small sample, which is possibly not the fair representation of the targeted trainee group. Overall, the impact of projects will improve substantially if more thoughts to be put in “what to train” and “who to train” – answers to which requires a thorough understanding of the demographical, economic, social context in the host country – in the design phase.

All three projects follow a streamlined execution and management process created and tested by UNIDO, hence are reliable and effective in terms of a reflective action plan or the maintenance of close and open communication. The major challenge for the management of projects lies in the lack of an updated evaluation system, which also requires official data from the government of the host country.

Since the priority of the programs external outputs lies in the social benefits of the projects. Assessed from the limited data we have on the impacts of three trainings on the employment situation of the participants, one can say that the projects are rather effective. However, there are three factors making identifying the precise social benefits difficult: the small sample size, an inability to precisely evaluate other variables affecting outcomes, and a lack of evidence on long-term benefits.

In conclusion, UNIDO (LKDF) VET projects is a satisfactory representation of its objectives in enhancing skills development and youth employment. The effectiveness of the projects can be amplified when i) training courses are more scientifically designed based on demographical, economic, social context of the host country; ii) a more strategic and inclusive approach is followed in recruitment process; and iii) a robust up-to-date evaluation system is set up.

5. Policy Implications

The employment challenge does not necessarily manifest in a high unemployment rate. The worse one's financial situation is, the less he can afford being unemployed. This observation is especially true to Sub-Saharan African countries. Majority of the region's working-age population works on family farms or household enterprise, with low productivity and earnings. Governments should address this issue by improving the productivity of small farms and household enterprise, apart from releasing stimulus packages and creating more jobs in the formal sector.

Young people going through the transition from school to work, often finds it hard for a clean transition and end up combining study with work. A considerable number of young people do not receive payment for their work. Policy makers could come up with a framework for the guidance and protection of young people entering labor market.

Solid empirical evidence from numerous research and experiments depicts a positive impact of VET on not only the participants' employment rate, but also on a number of labor market outcome indicators, including earnings, financial stability and skills. Though the extent of the positive impact varies treatment group by treatment group, VET's contribution in sustainably tackling employment challenges should be seriously considered by governments. A robust VET system does not only improve individuals' employment situation, but also benefits the ecosystem of the labor market. When designing a VET program, substantial amount of consideration should be put in the evaluation of the demographic, economic and social characteristics of the context and the specification of the objectives for a more profound impact.

A close partnership with various sectors can amplify the project's outcome by combining each's advantage and prevent mistakes that are foreseeable to others. Governments should consider an even closer partnership with IOs in tackling development related issues, including employment challenge. IOs need to work closely with the private sector, especially on projects carrying social responsibilities to deepen the impact. A development partnership (PPDPs) that unites IO, the private sector, development agency, and local government improves the effectiveness and efficiency of development programs, including that of VET.

Government should invest in skills development, which has a notable impact on the improvement of one's earnings, among other labor market outcome indicators. Developing individual's soft, green, digital skills and life-long learning have reached the agenda of IOs as well as a number of governments. Policy makers should consider coming up with a standardization on the definition and evaluation of the 21st century skills for a wider promotion and recognition, which will increase the mobility of the global labor market.

During the making of policies or the execution of projects, the inclusion of vulnerable or disadvantaged groups has to be ensured. Despite the fact that social inclusion is vital in achieving Agenda 2030 and its SDGs, vulnerable groups also represent a crucial part in the human capital structure, with the potential of producing more values when included.

Conclusion

VET improves participant's employment situation. We have studied how VET program benefits labor market outcomes, and how VET programs being implemented nowadays, mostly by IOs, often carries a social responsibility. We give equal attention to VET's both economic and social function. We see how a small variable can influence the estimates of VET's effects, we compare and come up with recommendations to deepen the positive impact of VET. Our paper sheds light on the benefits for a upgraded VET system for the standardization in program designing and execution; we also find development partnerships among IOs and the private sector has a huge potential to leave an impact; and that under similar circumstances, TVET is beneficial more than VET for in terms of skills development, employment performance, and industry sustainability. Naturally, the field evaluation is required for changes of materials. Nevertheless, the earlier technology is incorporated with VET curriculum, the more substantial the impact will be. VET programs need to be closely evaluated and revisited to fulfill their social objectives on employment improvement and poverty reduction.

One might argue that VET's impact on employment is not well justified for there is no longer-term evidence on its effects on labor market outcomes, which also makes sense. Besides the longer-term labor market outcomes, it is almost impossible to quantify the social benefits of VET's external output. But these reasons shouldn't stop one from promoting VET programs. Despite all the economic or social, short-term or long-term benefits of VET, it always has been a decent platform for skills development and life-long learning.

The main objectives of the paper is to build a multi-dimensional understanding of the impact VET training has on youth employment, and to introduce a criteria for the reference of current VET practices. By doing so it wishes to bring more attention and recognition to the social and individual benefits of vocational trainings.

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Appendix:

1.

The three 'classical' models of vocational education and training:			
	The liberal market model: Britain	The state-regulated model: France	The dual corporate model: Germany
Who determines how vocational education and training is organised?	Negotiated 'in the market place' between representatives of labour, management, and providers of vocational education and training.	The state	State-regulated chambers of craft trades, arranged by profession
Where does vocational education and training take place?	There are many options: in schools, in companies, in both schools and companies, via electronic media, etc.	In special schools, so-called 'production schools'	In predetermined alternation between companies and vocational schools ('dual model').
Who determines the content of vocational education and training?	Either the market or the individual companies, depending on what is needed at the moment. The content is not predetermined.	The state (together with the social partners). It does not aim primarily to reflect practice in enterprises, but relies instead on more general, theoretical training.	Entrepreneurs, unions, and the state jointly decide.
Who pays for vocational education and training?	As a general rule, the people who receive the vocational education and training are also the ones who pay for it. Some companies finance certain courses, which they themselves provide.	The state levies a tax on companies and finances vocational education and training, but only for a certain number of applicants each year.	Companies finance training within the enterprise and can set off the cost against tax. Trainees are paid a contractually determined sum. Vocational schools are financed by the state.
What qualifications are gained at the end of vocational education and training, and to what opportunities do these qualifications lead?	There is no monitoring of training, nor are there universally accredited final examinations.	There are state certificates which also entitle the best graduates to go on to higher courses.	The qualifications are generally recognised as entitling their holders to work in the relevant occupation and to go on to higher courses.

Table 2: Core and green competencies (ILO, 2015)

Functional area		Code	Unit title
A	Core competencies	CC-A1	Maintain professionalism in the workplace
		CC-A2	Receive and respond to workplace communication
		CC-A3	Communicate effectively with team members and customers
		CC-A4	Apply workplace safety practices and procedures
		CC-A5	Work sustainably and effectively
		CC-A6	Manage personal finances
		CC-A7	Address workplace harassment
B	Core competencies	CC-B1	Maintain professional development and career professionalism
		CC-B2	Lead workplace communication
		CC-B3	Prepare and report workplace information
		CC-B4	Lead small teams
		CC-B5	Prepare and implement negotiation
		CC-B6	Solve problems related to work activities
		CC-B7	Work sustainably and effectively
		CC-B8	Train or mentor others on a one-to-one basis
		CC-B9	Apply environmental principles and advocate awareness
C	Core competencies	CC-C1	Use special communication and management skills
		CC-C2	Develop teams and individuals
		CC-C3	Apply problem solving techniques in the workplace using critical thinking
		CC-C4	Plan and organize the work
		CC-C5	Manage own performance and workload
		CC-C6	Promote environmental management and safeguard environmental assets
		CC-C7	Assess and manage workplace health and safety

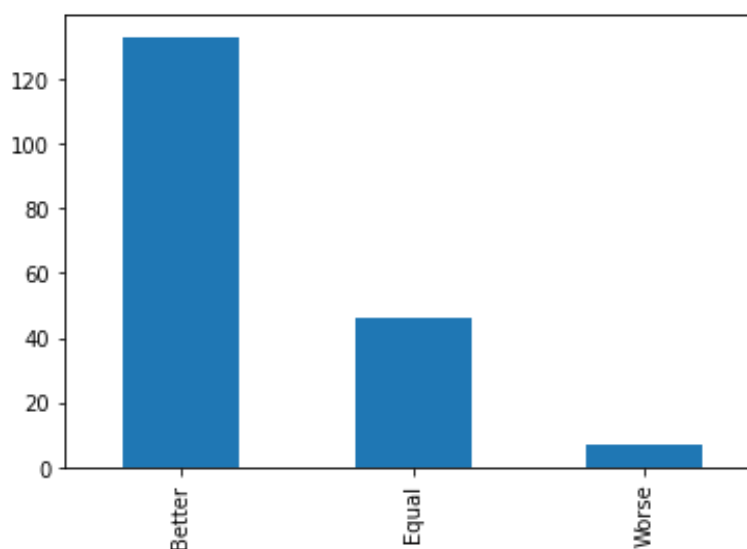
Figure 3: How would you rate your current job situation in comparison to your job situation before the training?

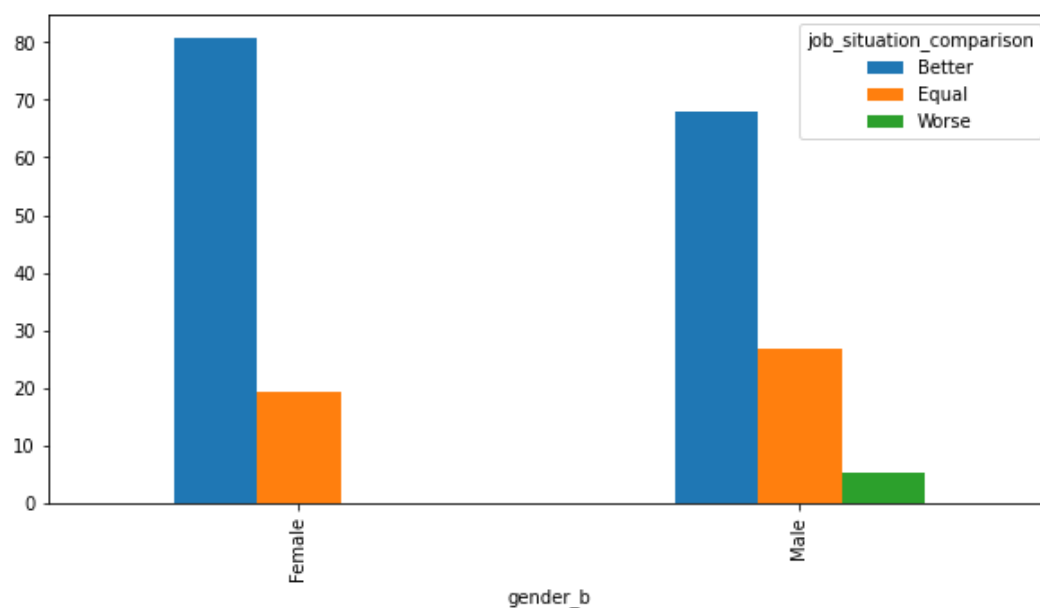
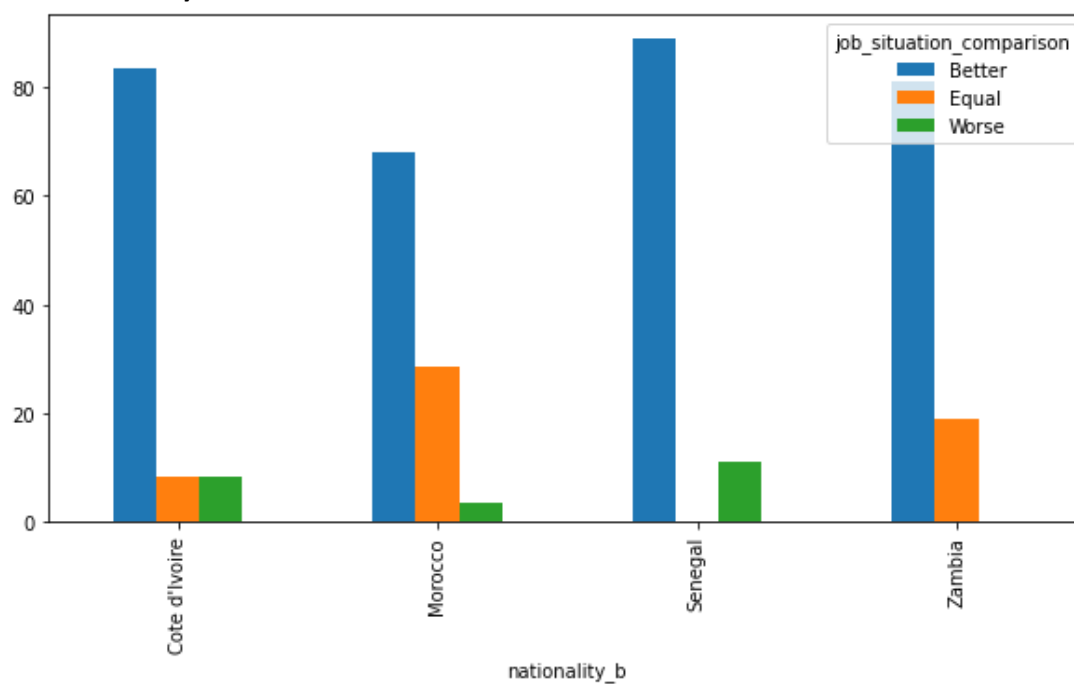
Figure 4: Job situation comparison under gender lenses**Figure 5: Nationality and Job situation**

Figure 6: How many people are earning more?

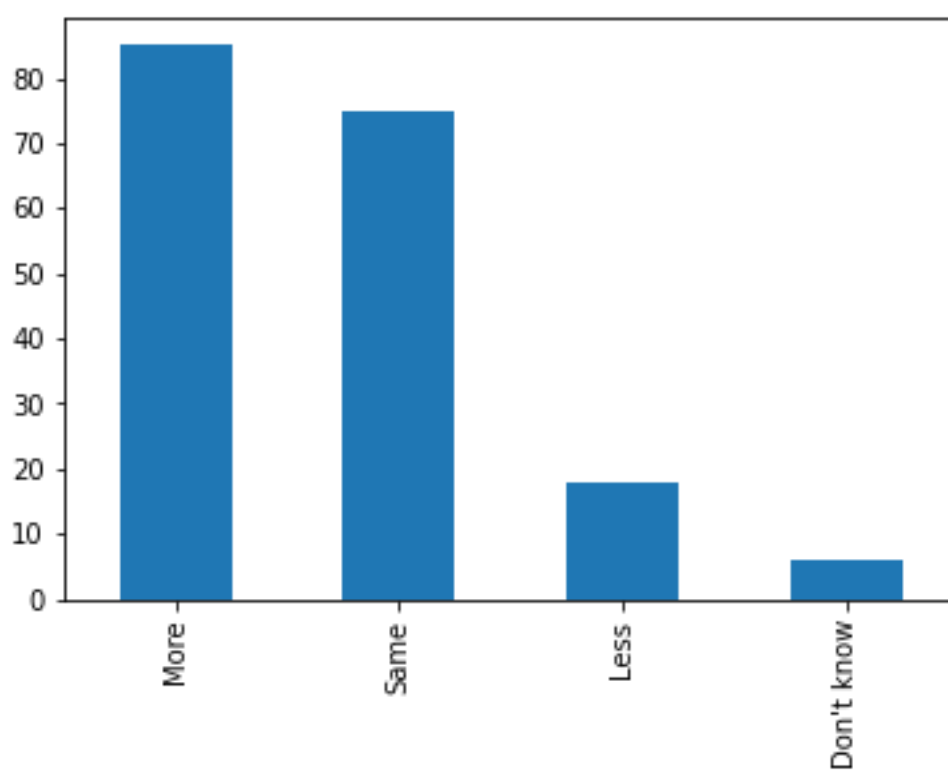
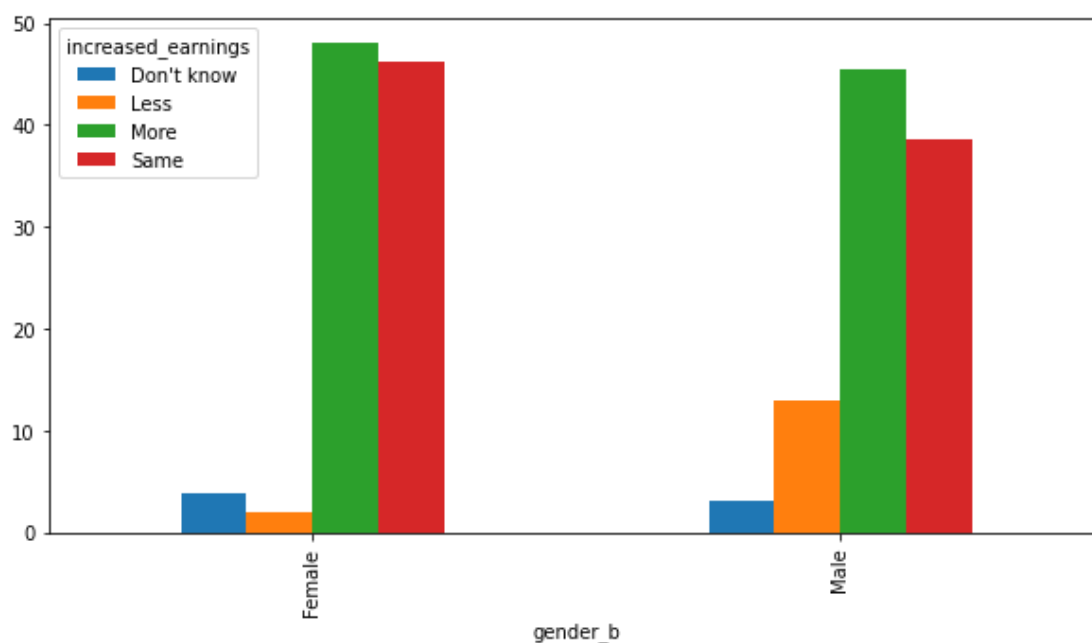


Figure 7: Increased earnings by gender



LKDF Survey:**STUDENT DATA (Baseline Only – To be entered under “Student Details”)**

I am going to start by asking a few questions about your background. This information will be used only for monitoring purposes, not for anything directly to do with the training programme, so please answer honestly. Some of the questions are about things like your religion and race. Remember, this information is collected for monitoring only. However, if you feel uncomfortable answering these questions, just say, ‘I want to move on to the next question’.

1. In what year were you born? (If the student does not know the year, ask about his age and calculate the year)

[]

2. What is your nationality?

xxx	1	[]
xxx	2	
xxx	3	
xxx	4	
xxx	5	
OTHER (SPECIFY _____)		6
REFUSE TO ANSWER	7	

3. What is your sex?

MALE	1	[]
FEMALE	2	[]

4. What is your legal status?

Single	1	[]
Married	2	[]
Divorced	3	[]
Widow	4	[]

HOUSEHOLD COMPOSITION (1-4 Baseline & Endline; 5-6 Baseline only)

Now I am going to ask you some questions about people in your family and your household.

1. How many people live in the same residence as you? By residence I mean the house or apartment that you currently live in.

[] People IF ZERO; Go to question 5.

2. How many people in your household are you supporting financially?

[] People

3. How many of your family members work and contribute to the household income?

[] People

4. What is roughly your monthly household income?
 [] USD / [local currency] PER MONTH
5. How many children do you have?
 [] children IF ZERO, END SECTION
6. How many of your children are you supporting financially?
 [] children

EDUCATIONAL BACKGROUND (Baseline only)

I would now like to learn more about your educational background.

1. Is [first spoken language of the country] your mother tongue?
 YES 1 []
 NO 2
2. Do you speak [first spoken language of the country]?
 YES 1 []
 NO 2
3. Can you read and write in [first spoken language of the country]?
 YES 1 []
 NO 2
4. Do you know how to do arithmetic?
 YES 1 []
 NO 2
5. What was the highest diploma or certificate you obtained?
 HIGH SCHOOL 1 []
 BACHELOR 2
 MASTERS 3
 PHD 4
 TECHNICAL DIPLOMA 5
 HIGHER ED DIPLOMA 6
 OTHER (SPECIFY _____) 7
 NONE 8

VOCATIONAL TRAINING (Baseline only)

Now I am going to ask you some questions about your experience with vocational training.

1. Have you taken any job training courses after formal schooling or higher education?
 YES 1 []
 NO 2

2. How many months of training have you taken altogether?

NUMBER OF MONTHS []

3. What was the subject of the most recent training course?

LANGUAGE	1	[]
COMPUTERS	2	
TECHNICAL SKILLS	3	
SECRETARIAL SKILLS	4	
PROFESSIONAL SKILLS	5	
OTHER (SPECIFY _____)	6	

YOU ARE NOW ENROLLED AT [name of VTC] AND I WILL ASK YOU SOME QUESTIONS ABOUT YOUR EXPECTATIONS OF THE COURSE.

4. What course do you take at the [name of VTC]?

xxx (xx weeks)	1	[]
xxx (xx weeks)	2	[]
xxx (xx weeks)	3	[]

5. Why did you choose to enrol in this vocational training programme?

Interest / passion for subject	1	[]
Nearby my home	2	[]
Expected earnings	3	[]
Accommodation available	4	[]
Family pressure	5	[]
To keep myself busy	6	[]
Good addition to my current jobs	7	[]
Other (specify _____)	8	[]

6. What do you think your earnings per month will be once you have graduated from your vocational training course?

[] USD / [local currency] PER MONTH

7. What industry or sector do you expect to work in after completing the training at [NAME OF VTC]?

SPECIFY _____

JOB SITUATION (1-8 Baseline & Endline; 9-12 Endline only)

I now want to learn about your job situation just before you started your course at [name of VTC].

1. How would you describe your job situation?

Full time employed	1	[]
Part time employed	2	[]
Full time self-employed	3	[]

Part time self-employed	4	[]
Full time student	5	[]
Part time student	6	[]
Full time family business or farm	7	[]
Part time family business or farm	8	[]
Unemployed, looking for jobs	9	[]
None of these (specify _____)	10	[]

IF STUDENT OR UMEMPLOYED; continue with question 10.

IF EMPLOYED, SELF EMPLOYED or FAMILY BUSINESS, continue with next question 2.

2. What industry or sector you working in?

AGRICULTURE	1	[]
MINING / OIL / GAS	2	
MANUFACTURING		3
MECHANICS	4	
GOVERNMENT	5	
TEACHING		6
ELECTRICITY / WATER / GAS	7	
COMMERCE	8	
TRANSPORT	9	
FINANCIAL SERVICE	10	
CONSTRUCTION	11	
OTHER (SPECIFY _____)		12
N/A	13	

3. What company do you work for?

Public	1	[]
Private	2	[]
N/A`	3	[]
SPECIFY name of the company		

4. What type of job are you doing? What is your job title?

SPECIFY _____

5. What are your earnings per month from your work / from all jobs combined?

[] USD / [local currency] PER MONTH

6. How much in kind benefits like transport, food or housing did you receive per month?

[] USD / [local currency] PER MONTH

7. How would you describe your financial situation?

- Enough to sustain my direct family, myself and do some savings 1 []
- Enough to sustain my direct family, myself and other relatives 2 []
- Enough to sustain my direct family and myself. 3 []
- Enough to sustain myself. 4 []
- Not enough to sustain myself. 5 []
- Other (Specify _____) 6 []

8. How would you describe your job?

- The job suits my qualification. 1 []
- I am overqualified for the job. 2 []
- I have to learn a lot before I can perform well in my job. 3 []

9. How was your experience finding your current job?

Please describe your experiences!

- I could use the contacts I made during the training to find this job 1 []
- It was easy finding a better job with my new skills 2 []
- I went back to my old workplace but now I am in a better position 3 []
- The training did not change my job situation 4 []
- It was difficult to find a job after the training 5 []
- With the new training, it was harder to get a job than before 6 []
- I could not find an adequate job with my new skills 7 []
- The VTC helped me find my current job 8 []

Other (please specify) 9 []

10. How would you rate your current job situation in comparison to your job situation before the training?

Better 1 []
 Worse 2 []
 Equal 3 []

11. Do you now earn more than before the training?

More 1 []
 Less 2 []
 Same 3 []
 Don't know 4 []

12. Would you recommend the course you did at [NAME OF SCHOOL] to your friends and family?

YES 1 []
 NO 2 []