Nexus between Non-Cognitive and Cognitive Skills and their Joint effect on Labour Market Outcomes: Evidence from Youths aged 15–25 years in Kenya

Carol Bisieri Onsomu
John Macharia
Stephie Mwangi

HCD-ICCS-003

AFRICAN ECONOMIC RESEARCH CONSORTIUM
CONSORTIUM POUR LA RECHERCHE ÉCONOMIQUE EN AFRIQUE

Bringing Rigour and Evidence to Economic Policy Making in Africa

Nexus between Non-Cognitive and Cognitive Skills and their Joint effect on Labour Market Outcomes: Evidence from Youths aged 15–25 years in Kenya

By

Carol Bisieri Onsomu,
John Macharia
University of Nairobi

Stephie Mwangi
Egerton University

African Economic Research Consortium, Nairobi
August 2024

THIS RESEARCH STUDY was supported by a grant from the African Economic Research Consortium. The findings, opinions and recommendations are those of the author, however, and do not necessarily reflect the views of the Consortium, its individual members or the AERC Secretariat.

Published by: The African Economic Research Consortium
P.O. Box 62882 - City Square
Nairobi 00200, Kenya

Contents

List of tables

List of figures

Abbreviations

BFI	Big Five Inventory
CBET	Competency Based Education Training
FDI	Foreign Direct Investments
ILOSTAT	International Labour Organization StatisticsGDPGross County Product
GoK	Government of Kenya
KILMS	Kenya Labour Market Information System
KNBS	Kenya National Bureau of Statistics
TVETs	Technical and Vocational Education Training
UNESCO	United Nations Educational, Scientific and Cultural Organization

Abstract

Cognitive skills, rooted in specific neural networks, and soft skills, comprising personal traits, attitudes, and motivations, jointly contribute to workforce adaptability in the ever-changing landscape of modern workplaces. Recognizing their pivotal role in enhancing human capital quality, this study explored their joint impact on labour market outcomes, including probability of employment. Traditionally, economists have predominantly emphasized cognitive skills, overlooking the significance of the non-cognitive dimension. Within the context of Kenya, the government has launched initiatives to empower its youth for social and economic development and the education sector has expanded. Despite this background, these efforts fall short of producing adequately trained middle level human capital, hindering national progress. This situation is aggravated by the grave concern of a job market mismatch, resulting in soaring youth unemployment rates. The root cause of this mismatch can be partly traced to the limited inclusion of non-cognitive skills in education curricula, despite ongoing reforms largely centred on cognitive development. Both in education and the workplace, non-cognitive factors emerge as stronger predictors of success than their cognitive counterparts. Occupations demanding a blend of cognitive and non-cognitive skills offer higher employment prospects and wage premiums. A synthesis of these skill sets renders workers more valuable and better positioned for career advancement. Addressing the pressing issue of youth unemployment necessitates the alignment of youth skills with labour market demands. This research seeks to address two key challenges: gender disparity and the mismatch between youth skills and available job opportunities. Using binary logistic regression, this study identified factors influencing youth employment, with a specific focus on the interplay between skills and values. Key findings underscore the importance of both cognitive and non-cognitive skills in labour market outcomes, with individuals possessing a combination of these skills enjoying improved employment prospects and career success. The study also revealed that the complementarity between agreeableness and digital literacy skills has a positive impact on the employment likelihood of female youth. Marital status signifies stability and responsibility, while education levels augment an individual's competencies, enhancing competitiveness in the job market. Consequently, this study emphasizes the equivalence of personality traits and cognitive abilities in the eyes of employers and advocates for curriculum reform that integrates personality traits into employers' selection criteria.

Keywords: cognitive skills, non-cognitive/soft skills, labor market outcomes

1. Introduction

Cognitive skills refer to abilities such as problem-solving, critical thinking and analytical skills, and non-cognitive skills encompass personal traits like communication, teamwork, motivation and time management. Pierre et al. (2014) define cognitive skills as a set of mental abilities and processes that enable individuals to acquire and use knowledge, solve problems and engage in critical thinking. These skills include a wide range of abilities such as perception, attention, memory, language, reasoning and creativity. According to these authors, cognitive skills are essential for individuals to succeed in various areas of their lives, such as education, employment and personal relationships. These skills also play a crucial role in cognitive development and overall well-being. Pierre et al. (2014) note that cognitive skills are not fixed and can be improved through practice and training. Furthermore, they argue that early intervention and education can have a significant impact on the development of cognitive skills in children. These skills typically involve mental processes such as decision making, problem solving and attention, as similarly noted by Green (2011).

Further, Borghans et al. (2008) define non-cognitive skills as personal characteristics, personality traits and attitudes that are not directly related to cognitive abilities but are important for success in various areas of life. These skills include traits such as perseverance, self-control, motivation and social skills, among others. According to Borghans et al. (2008), non-cognitive skills are essential for success in education, employment and personal relationships as they facilitate the acquisition and application of knowledge and enable individuals to navigate complex social and emotional situations. These authors further assert that non-cognitive skills can be strengthened by treatments and training programmes. For example, Durlak et al. (2011) in his meta-analysis examined 213 school-based, universal social and emotional learning (SEL) programs involving over 270,000 students from kindergarten through high school. The findings indicated that SEL interventions led to significant improvements in academic performance, with students showing an 11-percentile-point gain in achievement scores compared to controls. Additionally, the interventions were associated with reductions in conduct problems and emotional distress among students showing that interventions that focus on social and emotional skill development can boost academic achievement and decrease problem behaviours in children. Borghans et al.

(2008) also stress the significance of non-cognitive abilities in predicting many outcomes, including academic success, financial security and physical health. They contend that while evaluating an individual's abilities and developing interventions targeted at fostering success, non-cognitive skills should be considered alongside cognitive capabilities. Overall, Borghans et al. 2008 emphasize the significance of non-cognitive skills in various domains and highlight the potential benefits of enhancing these skills through targeted interventions and training programmes.

Empirical research has indicated that non-cognitive skills are positively associated with employment outcomes, education and training. In fact, Farkas, (2003) shows that non-cognitive factors are more significant predictors of success than cognitive factors, both in the workplace and in educational settings. Recent literature by Weinberger (2010) and Deming (2017) suggests that non-cognitive skills can complement cognitive skills. Weinberger (2010) found a growing complementarity between cognitive and social skills in the United States. Additionally, the research demonstrated that the employment and wage premiums for occupations that require both types of skills are notably higher than those for occupations that require just one or neither of these skills.

In today's knowledge-based economy, employers value workers who can adapt to new technologies and changing business environments. Having a mix of cognitive and non-cognitive skills can make workers more valuable to employers and help them succeed in their careers and adjust to changes in technology and the ever-changing contemporary workplaces. To meet labour market demands and give the youth a competitive edge in their efforts to progress their professions, relevant youth skills must be tailored in the face of acute youth unemployment that exists around the world. Youth unemployment is 2 to 4 times more common than adult unemployment in most nations, standing at 14% (ILO, 2020). In Kenya, the youth unemployment rate is 3 times higher than adult unemployment (Sylvia and Aisha, 2017) and stood at 14% in the 2022 financial year (ILO, 2020). The youth population and the number of young people acquiring cognitive skills (that provide learners with the capability to read, write, reason and think) in Kenya continues to bulge. The working age population (15–64 years old) is 57% of the total population, with 63% representing the youth aged 15–34 years (KNBS, 2019)

In sum, this paper highlights the importance of non-cognitive skills in the Kenya labour market not only as separate factors that influence probability of employment but as complements to cognitive skills. The link between skills and labour market outcomes is an important issue for individuals, employers and policy makers. Skills refer to the abilities, knowledge and competencies that individuals possess, and labour market outcomes refer to the economic outcomes that individuals experience in the labour market, such as probability of employment, wages and job quality. The link between skills and labour market outcomes has several implications: (i) *Implications for individuals*: The skills that individuals possess are a key determinant of their labour market outcomes. Individuals with high levels of skills are more likely to be employed,

earn higher wages and have better job quality than individuals with lower levels of skills. Therefore individuals who invest in their skills through education, training and work experience are more likely to achieve better labour market outcomes than those who do not. However, the cost of acquiring skills can be high, both in terms of time and money, and there is no guarantee that investments in skills will lead to better labour market outcomes. Therefore individuals need to carefully consider the costs and benefits of acquiring skills; (ii) *Implications for employers*: Employers benefit from hiring workers with high levels of skills, as these workers are more productive, efficient and innovative. Therefore employers may be willing to pay higher wages and provide better working conditions to attract and retain workers with high levels of skills. However, employers may also face challenges in identifying and evaluating the skills of potential workers, especially in industries with rapidly changing technologies and job requirements. This suggests employers may need to invest in training and development programmes to ensure that their workers have the necessary skills to meet the demands of the job; and (iii) ***Implications for policy makers***: Policy makers play a critical role in promoting the acquisition and utilization of skills in the labour market. Policies that promote education, training and skill development can help ensure that individuals have the necessary skills to succeed in the labour market and can help reduce inequality and poverty. In addition, policy makers can promote the utilization of skills by addressing challenges that employers face in identifying and evaluating the skills of potential employees. Furthermore, they can ensure that their policies are responsive to the changing demands of the labor market..

The Kenya government has launched several initiatives over the years to empower and enable young people to catapult themselves to social and economic development. Over the past four decades, the education scene has expanded but the outputs required to meet labour market demands (enough trained middle level human capital) for national development are dissatisfying (Brewer and Comyn, 2015). Education institutions in Kenya continue to face challenges, such as limited information on what skills are necessary for employment; and limited collaboration with industries in the country resulting in a mismatch between skills imparted to youth and those required in the labour market (Anindo et al., 2016; United Nations Educational, Scientific and Cultural Organization (UNESCO), 2017). To try bridge the two gaps, the government collaborated with the industry to develop the Kenya Labour Market Information System[2] (KLMIS) and other survey tools for information on real employability of graduates and the needs of the labour market. However, this publicized database only emphasizes the cognitive domain/occupational-specific skills of learning, downplaying the non-cognitive domain/core skills despite their skills and attitudes (such as dexterity, situational awareness, teamwork, effective communication, professionalism, compassion or resilience) being the key demands in the contemporary workplace, lack of which has caused structural unemployment in the country.

Given that the youth unemployment rate in Kenya remains on an upward curve, despite government efforts to bridge the gap, this paper investigates the interaction between training (non-cognitive skills and cognitive) skills and the joint effect of the interaction on the labour market outcomes. The purpose of this paper was informed by several recent studies that focused on contrasting non-cognitive/soft skills with cognitive/hard skills like literacy and numeracy to assess which is superior against the other. Some of these studies (Holzer, H. J., & Lerman, R. I. (2015)) have looked into the direct effects of cognitive/hard skills on the labour market while others (Nomura and Adhikari Samik, 2017) have looked into the direct effects of non-cognitive/soft skills on the labour market. Other aspects of research in this area (Balcar, 2016; Kapfudzaruwa et al., 2018; Laajaj and Macours, 2019; Ottchia, 2019) defined and measured non-cognitive skills in disparate ways, assessed them in isolation, and focussed on short-term outcomes (employed or not) or measured the effect of transferable skills (a mix of non-cognitive and cognitive skills but without assessing the interaction) on education and employment outcomes. As a result, gaps exist in the evidence.

This paper answers the following question: How complementary are non-cognitive skills with cognitive domains and their joint effect on youth employability and youth wages considering gender distribution and employment status?

The contribution of this study is to add to the body of knowledge on the interaction of non-cognitive skills and cognitive skills and their joint effect on two labour market outcomes[3]. First, we assessed the interaction between the big five personality traits and cognitive domain and investigated the joint effect on youth wages using the multinomial logit model. Second, we controlled for the joint interaction of cognitive and non-cognitive skills and assessed the effect on youth employability (employed and unemployed) using the binary logit model. This is the first in-depth analysis of the interaction of comprehensive personality traits on cognitive skills and the joint relation to youth wages and youth employability outcomes in the Kenyan context. Since wages are provided only for employed respondents, a Heckit model was applied to test and correct for potential biases brought on by non-random missingness in the wage labour market outcome, minimizing the impact or removing the test's statistical significance.

2. Literature review

2.1 Theoretical Framework

Human capital theory denotes the totality of investments in education, training, skills, talents and experiences that make an individual more productive (Goode, 1959). The theory further postulates that the higher the human capital accumulation the higher the productivity and the more it will lead to higher individual value and increase an individual's access to more lucrative labour markets (Blanden and Machin, 2010). The Human Capital Theory, claims that different levels of schooling and training correlate with different levels of wages and salaries, and that the more knowledge, skill and ability a person possesses, the more likely they are to land a better job (Blair, 2012). However, the Signalling theory highlights that schooling alone does not increase an individual's productive capacity but rather serves as a signal to inform the labour market of an individual's skills. Therefore, individuals with higher ability use their schooling to gain education signals that communicate their skills to employers, enabling them to achieve higher pay and high prestige. The human capital theoretical construct is incorporated in this paper to help understand the country's social and economic changes that can help policy makers strategize on how youths can increase access to the labour market to spur creation of wealth.

The labour market is conceptualized from a demand and supply perspective. Firms that want to hire people are regarded as the demand side of the labour market while households/individuals who are willing and able to go to work are the suppliers in the labour market context. Macroeconomic factors like technological change, globalization, inflation rate, foreign direct investment (FDI) and gross domestic product (GDP) affect the demand side of the labour market while the supply side is affected by microeconomic factors like demographics, extent of skills acquired and education and vocational training (Beata, 2021).

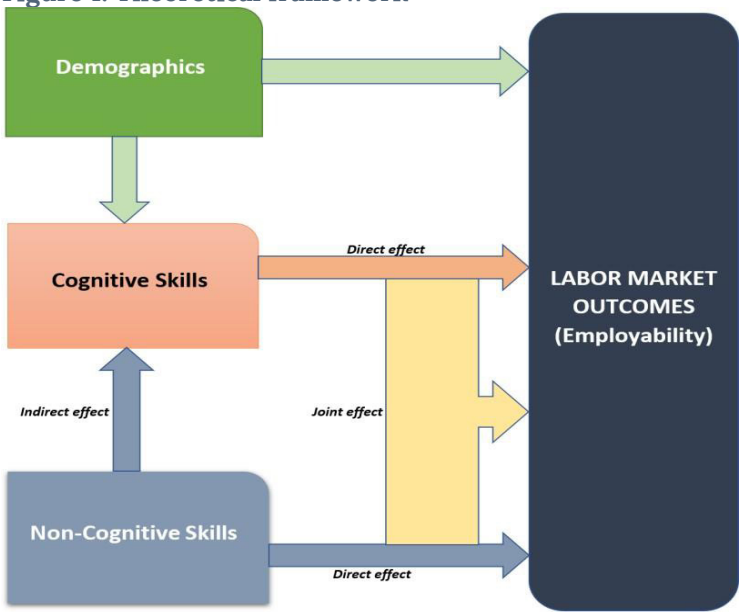
Traditionally, researchers focused on a very narrow understanding of human capital thinking on education in a particular schooling and in the informal context which partly contributes to the persistent mismatch between education and demands in the labour market resulting in structural unemployment. Therefore, this study investigated supply side factors linked to human capital theory that explain labour market outcomes with the aim to develop clear and specific recommendations that inform training institution curriculum. According to Figure 1, labour market outcomes

are directly influence by demographics, cognitive skills and non-cognitive skills. As observed noncognitive skills also have an indirect effect on the labour outcomes by influencing cognitive skills.

Hypothesis generated from the framework in Figure 1 is:

H1: There is a significant relationship between the interaction of big five personality traits/ non- cognitive skills and cognitive skills and Labour market outcomes in Kenya.

Figure 1: Theoretical framework



2.2 Empirical Literature

This section focuses on a review of related recent studies. The review by Palczyriska (2020) investigated the degree of complementarity between non-cognitive and cognitive talents and their combined effects on individual earnings in Poland. The purpose of the study was to determine the extent to which non-cognitive and cognitive skills were complementary and how much of an impact they had on individual earnings. A semi-logarithmic model was employed to assess if character skills that limit the effect of cognitive skills on salaries and therefore the interactions between non-cognitive and cognitive skills were taken into consideration. Models were estimated separately for men and women. The covariates used in the model are available in Annex A. The results showed that non-cognitive abilities are significant in the labour market, not only as independent variables that affect salaries but also as additives to cognitive skills. There were existent complementarities for both genders between emotional stability and cognitive skills (numeracy), meaning neurotic individuals exhibited lower wage returns to cognitive skills than their less-neurotic colleagues. The fact that the data did not allow Palczyriska (2020) to completely rule out endogeneity issues is an important limitation in the study. Additionally, the study did not examine

the causal links between personality traits and individual pay. The author further suggested that future research with larger sample sizes might examine the process of job selection in greater depth. The unanswered question would be whether certain non-cognitive skills increase a person's likelihood of working in a certain occupation within the larger occupational categories examined in this study.

A similar study by Weinberger (2010) explored the interactions of males and linked their study to the Utility Theory where they classified three types of workers: those with cognitive skill, those with soft skills and those with both cognitive and soft skills. The study highlights the analogy that if workers apply one skill at a time, then their wage and productivity premiums will not be as high as those of workers who are multi-skilled to simultaneously incorporate both skills in their tasks for higher productivity and wage premiums. Weinberger (2020) showed increasing complementarities between leadership and participation in clubs with math scores. This indicates that persons with higher levels of math scores and those who participated in leadership or sports activities in high school were highly demanded for in the labour market and earned more than those who did not, and that the interaction between cognitive and social abilities have long been considered significant variables in wage determination. This research, however, still triggers areas for further research particularly on the role of cognitive scores in determining women's entry jobs thus narrowing the gender gap and the role of scores in determining development of social skills that complement cognitive skills in high level job tasks.

The review by Deming (2017) evaluated returns to the social domain of human capital and investigated the complementarities between the cognitive and social domains using the Mincer Wage model and using STEM data. The author regressed hourly wages as the outcome on both skill proxies after controlling for additional covariates. Findings from the study show complementarity between cognitive and social skills, and positive labour market returns in regards wage to both skills. Further, the study showed that individuals with greater social skills are more likely to work in occupations that require a high level of social skills and that these occupations pay substantially higher wages.

3. Data and stylized facts from the data

This study utilized a national cross-sectional survey data set collected by Dalberg via the Ujana 360 *(Ujana360 - Zizi Afrique Foundation)* programme that targeted as respondents: youth not in employment, education or training; youth in technical and vocational education and training (TVET) institutions; and youth working in formal and informal sectors. The national cross-sectional survey was conducted by Dalberg organization in 2018 in Kenya using a series of methodologies for data collection. The survey used a multistage sampling technique to select 250 enumeration areas (EA) based on the probability proportionate to size and stratified by rural–urban location. In each EA, households with youth were listed and then selected using systematic random sampling (skipping interval) from the household lists. About 10 youth were targeted from each EA, aged between 15 and 25 years. In households that had more than one suitable respondent, only one respondent was selected for the interview using the last-birthday method. The survey successfully reached 2,361 youth from all the 47 counties in Kenya.

The survey questionnaire mainly captured quantitative information on demographic and socio- economic characteristics of the youth; respondent's awareness and perceptions towards TVETs; respondent's employment status and perceptions on the prevailing economic scenario of youth employment; youth's capabilities, values, and skills; work and life outcomes and factors influencing them; and a human-centred design study assessing the capabilities of the youth in literature and numeracy.

4. Methodology

4.1 Elicitation of personality traits

This subsection elaborates how we measured personality traits. This study draws on David Watson's overview of the evaluation of personality to understand the many approaches developed to measure personality traits and non-cognitive abilities (Clark, L. A., & Watson, D., 1999). The authors claims that humanistic oriented models contend that people have a distinct manner of outlining their goals and actively working to accomplish them, therefore it makes sense to ask them about themselves and their goals directly. However, the authors expresses concerns about the psychodynamic oriented theories that stand in contrast to the humanistic theories by asserting that since human feelings, motives and behaviours are influenced by mechanisms that they are unaware of, it is pointless to directly enquire about them. Identifying the non-conscious elements would consequently require a completely different approach.

Objective tests are usually used to measure non-conscious personality traits by using a limited set of response options (e.g., true or false; strongly disagree, slightly disagree, slightly agree, strongly agree). Responses to these questions are graded in accordance with preset criteria. For example, self-ratings on questions assessing belief in oneself (locus of control), social orientation, peer-pressure resistance and assertiveness can be summed up to create an overall score on the personality trait of extraversion. More specifically, the Dalberg questionnaire used the big five inventory approach that comprises five personality traits, namely extraversion, agreeableness, openness, conscientiousness and neuroticism. Each of these traits represent a scored scale and individuals can fall anywhere on the scale for each trait. In the Dalberg survey, the instrument administered 52 general questions that were grouped into four main sets of questions: capabilities and values (comprising trust, self-confidence, opportunism, hope, persistence, dependability, openness, locus of control, social orientation, loyalty and conviction); intrapersonal skills (self-esteem, emotions, stress and self-awareness); interpersonal skills (peer-pressure resistance, assertiveness, effective communication, interpersonal relations, empathy and negotiation); and decision-making skills (problem solving, curiosity, critical thinking and creative thinking).

Specifically, each value under the capabilities and values set was measured by three questions each on a five-point Likert scale where (1 = Strongly disagree; 2 = Disagree; 3 = Neither agree nor disagree/uncertain; 4 = Agree; and 5 = Strongly Agree). The score for each individual response for each question was a minimum of 1 and a maximum of 5 totalling the trust score to 15. This meant a respondent could score between 1 and 15 for each of the values under the capabilities and values set. The total scoring for each of the values under intrapersonal skills, interpersonal skills and decision-making skills was a minimum of one and a maximum of five.

Focusing on the Big Five Inventory (BFI) classification, the specific values and skills mentioned from the four main sets of questions were then mapped to the BFI classification as shown in Annex B that would see the values grouped into the BFI scale (extraversion, agreeableness, openness, conscientiousness and neuroticism/ emotional stability on a positive Likert scale).

Table 1: Classification of attributes based on the Big Five Inventory (BFI) classification

	BFI	Definition	Values as classified
1	**Extraversion**	Directing one's interest towards the outer world of people and things, rather than the inner world of subjective experiences characterized by positive affect and sociability	Belief in oneself (locus of control), social orientation, peer-pressure resistance, assertiveness
2	**Agreeableness**	The tendency to act cooperatively and in an unselfish manner; gets along with others and is empathetic and works well in a team	Trust, loyalty, interpersonal relations, empathy, negotiation
3	**Openness**	Captures one's tendency to be open to new experiences (aesthetic, cultural or intellectual)	Opportunism-optimistic, openness, curiosity, critical thinking, creative thinking
4	**Conscientiousness**	One's tendency to be organized, hardworking and responsible	Dependability, effective communication, problem solving

5	**Emotional stability**	Predictability and consistency in emotional reactions with absence of rapid mood changes Neuroticism is "a chronic level of emotional instability and proneness to psychological distress"	Self-confidence, hope, persistence, conviction, self-esteem, emotions, stress, self-awareness

The Big Five Inventory is influenced by both genes and environment with an estimated heritability of 50% and is used to predict life outcomes like education and health.

4.2 Probability of being employed among the youth model specification

To describe the joint effect of the interaction between cognitive and personality traits on youth employment, the study used comparative analysis of youth skills and values based on their gender (male or female). Descriptive statistics in terms of percentages were generated and inferential statistics such as the t-test were used to test for differences by employment status. Determination of the link between non-cognitive and cognitive skills and the joint effect on youth employment in Kenya was achieved by estimating an empirical model.

Objective: The study adopted the binary logistic regression to determine the factors that influence youth employment, including the interaction of skills and values as explanatory variables, also controlling for other covariates. The binary logistic regression is suitable because the outcome variable (youth employment status) is categorical and dichotomous in nature taking a value of 1 for youth employed and 0 for youth unemployed in the survey.

To analyse the factors that influence the probability of being employed among the youth, the binary logistic regression was estimated as follows (Bewick et al., 2005; Long and Freese, 2006)

$$Y_i = ln\left(\frac{p}{1-p}\right) = \beta_0 + \sum_{i=1}^{n} \beta_i X_i + \varepsilon \quad (1)$$

Where Y is the employment status of a young person (either employed or unemployed); pp is the probability of being employed; $(1-p)$ is the probability of being unemployed; $\frac{p}{1-p}$ represents the odds of being employed; $i = 1 \ldots n$ and n is the total number of covariates; β_0 is the intercept term; β_i measures

the effect of a change in X_i on the probability of being employed; X_i captures the explanatory variables or covariates; and ε is the stochastic term. Therefore Y is equal to the odds of being employed relative to being unemployed among the youth and is also given as a function of the explanatory variables and the stochastic term to cater for omitted variables.

The covariates included in the binary logit model were drawn from previous empirical literature on factors influencing youth employment and skills needed for the 21st century (Ignatowski, 2017; Ndagijimana et al., 2018; Dean and East, 2019; Alawad et al., 2020; Fajaryati and Akhyar, 2020) and based on the available variables in the data set. These independent variables fall into four distinct categories: (i) socio-economic and demographic characteristics of the youth; (ii) non-cognitive skills; (iii) cognitive skills; and (iv) asset ownership.

The socio-economic and demographic characteristics focused on gender, age group, marital status, education level of the youth, presence of biological children and household size. Non-cognitive variables of interest for this study were extraversion, agreeableness, openness, conscientiousness and emotional stability. The cognitive skill variables were digital literacy, numerical literacy and literacy. Asset ownership variables included own a TV, own basic phone, own smartphone and own PC/ laptop. Most variables are categorical and binary in nature. The non-cognitive skills and values of youth were all measured on a five-point Likert scale to capture the level of agreement on value statements and the level of self-confidence on skill statements such as the intrapersonal, interpersonal and decision-making skills.

Marginal Effects

After parameter estimation, marginal effects of the covariates in the conditional distribution were estimated (Greene, 2012). Marginal effects provide the magnitude of the change in conditional probability of the outcome variable as the regressor changes holding all other regressors constant. The marginal effect for the bivariate probit model is then given by:

$$\frac{\partial \phi_2(X_1'\beta_1, X_2'\beta_2, \rho)}{\partial X_i} = \varphi(X_i'\beta_i)\phi_2\left(\frac{X_2'\beta_2 - \rho X_1'\beta_1}{\sqrt{1-\rho^2}}\right)\beta_i, i = 1,2 \quad (2)$$

The marginal effects for categorical variables shows how conditional probability changes as the categorical variable changes from 0 to 1 controlling for other variables.

5. Results

5.1 Socio-Demographic Characteristics of Youth, personality traits and Values Basedon Youth Employment Status and Gender (Descriptive and Inferential Results)

Table 1 presents the descriptive statistics by gender. According to the results, 51% of those employed were male and 24% were female. The differences were statistically significant at 1%. In regard to education, 52% of the males and 51%of the females had secondary education, and 37% and 37% of the males and femaleshad primary level of education. The differences in education were statistically significant at 1%. On average, most (68%) of the respondents were single and the difference between the genders was significant at 1%. The results further indicate that 17% and 66% of the sampled male and female respondents respectively had a child, on average, about 7% owned a TV, 46% owned a basic phone, 39% owned a smartphone and less than 2% owned a personal computer/laptop. In terms of household size,the respondents were from households with at least five household members though males were from households with at least four household members. The difference in household size was statistically significant at 1%, suggesting that the results are not likely due to random variation or sampling error, but rather to a true difference or effect in the data. Therefore, the null hypothesis (the hypothesis that there is no difference or effect) can be rejected with 99% confidence.

In terms of cognitive skills, the results indicate that both male and female youth possessed digital literacy skills but were poor in literacy and numerical skills as measured on the number of correctresponses. However, both male and female youth seemed, to have poor scores on average, for non-cognitive skills on the three big five personality traits apart from emotionalstability trait which had a score of about 30 out of 65 for both gender and conscientiousness which had a score of 11 out of 25 for both genders (Table 1). It is apparent that the youth skills, both cognitive and non-cognitive skills affect the employers' attitude towards youth employability.Therefore, the scores show the practicality of the personality traits complementary to cognitive skills in ensuring increased employability among the youth. This implies that improvement of cognitive and non-cognitive curriculum programmes is key in enhancing its spread nationwide so as tosolve unemployment among the youth.

Table 2: Descriptive statistics by gender

	Male (n = 871)	Female (n = 1,489)	Total	Chi square/t-statistic
Age group (%)	36.91	63.09		
15–17 years	3.68	3.65	15-17	0.47
18–22 years	39.39	40.76	18-22	
22–25 years	56.93	55.59	22-25	
Employment status				
Employed (%)	0.51	0.24		13.54***
Education of the respondent				
No formal education (%)	3.41	4.93	4.19	4.55***
Primary schooling (%)	36.63	37.09	36.86	
Secondary schooling (%)	52.01	51.23	51.61	
Post-secondary schooling (%)	7.95	6.74	7.33	
Marital status of the respondent				
Single (%)	84.72	52.96	68.36	276.90***
Married (%)	14.76	43.83	29.73	
Widowed/divorced (%)	0.52	3.21	1.91	
Respondent has a child	0.17	0.66		-24.26***
	(0.011)	(0.014)		
Own a TV	0.09	0.05		3.29***
	(0.008)	(0.006)		
Own a basic phone	0.46	0.45		0.52
	(0.015)	(0.014)		
Own a smartphone	0.44	0.34		5.22***
	(0.015)	(0.014)		
Own a PC/laptop	0.03	0.01		3.19**
	(0.005)	(0.003)		
Household size	4.591	5.132	4.870	-4.23***
	(2.586)	(2.562)	(2.587)	
Cognitive skills (%)				
Digital literacy	0.93	0.88		3.765***
	(0.008)	(0.009)		
Literacy	0.92	0.91		1.103
	(0.008)	(0.008)		
Numerical literacy	0.81	0.74		4.078***
	(0.012)	(0.013)		
Non-cognitive skills/personality traits (scores)				

Agreeableness *(out of 55)*	14.11	13.82	13.96	3.69***
	(1.947)	(1.926)	(1.941)	
Conscientiousness *(out of 25)*	11.83	11.70	11.76	2.28**
	(1.406)	(1.345)	(1.376)	
Emotional stability *(out of 65)*	31.12	30.95	31.03	1.38
	(3.072)	(3.032)	(3.052)	
Extraversion *(out of 50)*	15.12	15.03	15.07	1.12
	(1.970)	(1.907)	(1.938)	
Openness *(out of 45)*	19.64	19.33	19.48	3.57***
	(2.112)	(2.126)	(2.125)	

Source: Author's calculation based on Dalberg data collected via the Ujana 360 (Ujana360 - Zizi Afrique Foundation)

Table 3 presents the general income distribution of the youth with 41% of the respondents earningbelow KES5,000 and 41% earning between KES 5,001 and 10,000

Table 3: General income distribution table

Income groups (in KES for the employed only) (%)	
5,000 and below	40.90
Between 5,001 and 10,000	40.92
Between 10,001 and 25,000	14.25
Between 25,001 and 50,000	3.10
Between 50,001 and 100,000	0.80

Source: Author's calculation based on Dalberg data collected via the Ujana 360 (Ujana360 - Zizi Afrique Foundation)

5.2 Estimating the Interactions of Cognitive and Non-cognitive and their joint and direct effects on Employability

The estimation results in Table 3, columns 1 and 2, show the interactions between digital literacy and each of the five BFIs and their joint effect on employability, holding other cognitive skills constant. The results further show the direct effects of the non-cognitive skills on digital literacy. Controlled for in the model are the socio-economic and demographic characteristics. Looking at thedirect effects on probability of employment, both male and female respondents in the age group of 22–25 years increased their probability of employment by 24% and 14% respectively at1% and 5% significance level respectively relative to those who were in the 15–17 years age group.Married male youth had 21% probability of being employed relative to single male youths at1% significance level. According to the joint effects analysis, agreeable female youths had higher returns to their digital literacy at 5% significance level, increasing their probability of employability by 5%.

Table 4: Joint effects of cognitive (digital literacy) and non-cognitive skills on employability

	Male Margins (dydx)	Female Margins (dydx)
Digital literacy (Yes/No)	0.568	-0.032
	(0.645)	(0.580)
Age group (Ref = 15–17 years)		
18–22 years	0.074	0.044
	(0.086)	(0.062)
22–25 years	0.244***	0.141**
	(0.088)	(0.064)
Education Level (Ref = No formal education)		
Primary schooling	0.224*	0.016
	(0.121)	(0.107)
Secondary schooling	0.140	-0.060
	(0.127)	(0.116)
Post-secondary schooling	0.144	-0.040
	(0.135)	(0.123)
Marital Status (Ref = Single)		
Married	0.214***	-0.030
	(0.050)	(0.028)
Widowed/Divorced	-0.055	0.032
	(0.188)	(0.072)
Has a child		
Yes	-0.023	0.046
	(0.051)	(0.030)
Agreeableness Score	-0.006	-0.033
	(0.027)	(0.023)
Conscientiousness Score	-0.030	-0.040
	(0.049)	(0.038)
Emotional Stability Score	-0.006	0.006
	(0.021)	(0.015)
Extraversion Score	0.026	-0.003
	(0.036)	(0.025)
Openness Score	0.023	0.041
	(0.035)	(0.029)
Digital*Agreeableness	0.030	0.049**
	(0.028)	(0.024)
Digital*Conscientiousness	0.036	0.037
	(0.050)	(0.040)
Digital*Emotional Stability	-0.005	-0.002
	(0.022)	(0.016)

Digital*Extraversion		-0.029	0.010
		(0.037)	(0.026)
Digital*Openness		-0.017	-0.039
		(0.036)	(0.030)
R-squared			
N	1139		1207
Wald test of rho = 0: $chi^2(1)$	5.277		12.2592
Prob > chi^2	0.0216		0.0005

* p<0.10, ** p<0.05, *** p<0.01

Table 5, columns 1 and 2, show the interactions between literacy and each of the five BFIs and their joint effect on probability of employment, holding other cognitive skills constant. The results also show the direct effects of the non-cognitive skills on digital literacy. Controlled for in the model were the socio-economic and demographic characteristics. This estimated model showed directeffects between the demographic characteristics and the non-cognitive skills on probability of employment though there were no joint effects. Similar to the previous model, both male and female respondents in the age group of 22–25 years increased their probability of employment by 26% and 15% respectively, both at 1% significance level relative to those who were in the 15–17 years age group. Male and female youth increased their probability of employment by 27%, 25% and 26% if they had primary, secondary and post- secondary schooling respectively at 1% significance level relative to if they had no formal education. Married male youth had 18% probability of being employed relative to single maleyouths at 1% significance level. Further, an agreeable male youth increased their probabilityof employment by 5% at 5% level of significance though if the male respondent had a unit increase in their emotional stability score, they would decrease their probability of employment by 3% at 5% level of significance.

Table 5: Joint effects of cognitive (literacy) and cognitive skills on employability

	Male Margins(dydx)	**Female Margins(dydx)**
Literacy (Yes/No)	-0.624	0.318
	(0.502)	(0.403)
Age group (Ref = 15–17 years)		
18–22 years	0.109	0.061
	(0.068)	(0.042)
22–25 years	0.259***	0.154***
	(0.070)	(0.044)
Education Level (Ref = No formal education)		
Primary schooling	0.387***	0.164***
	(0.057)	(0.030)

Secondary schooling	0.346***	0.152***
	(0.057)	(0.029)
Post-secondary schooling	0.347***	0.168***
	(0.070)	(0.047)
Marital Status (Ref = Single)		
Married	0.185***	-0.035
	(0.047)	(0.024)
Widowed/Divorced	-0.056	0.012
	(0.173)	(0.061)
Have a child		
Yes	-0.015	0.044*
	(0.045)	(0.024)
Agreeableness Score	0.050**	-0.004
	(0.020)	(0.013)
Conscientiousness Score	0.017	0.004
	(0.031)	(0.021)
Emotional Stability Score	-0.028**	-0.002
	(0.014)	(0.010)
Extraversion Score	-0.005	0.004
	(0.015)	(0.016)
Openness Score	0.007	0.008
	(0.020)	(0.017)
Literacy*Agreeableness	-0.033	0.015
	(0.021)	(0.014)
Literacy*Conscientiousness	-0.010	-0.012
	(0.033)	(0.024)
Literacy*Emotional Stability	0.022	0.006
	(0.014)	(0.011)
Literacy*Extraversion	0.003	0.001
	(0.017)	(0.017)
Literacy*Openness	-0.001	-0.004
	(0.022)	(0.018)
R-squared		
N	1139	1207
Wald test of rho=0: chi²(1)	15.79	.000119
Prob > chi²	0.0001	0.9913

* p<0.10, ** p<0.05, *** p<0.01

Table 6, columns 1 and 2, show the interactions between numerical literacy and each of the five BFIs and their joint effect on probability of employment holding other cognitive skills constant. The analysis only showed direct effects between the social and demographic factors on probability of employment. Married male youth had 16% probability of being employed relative to single male youths at 1% significance level.

Both male and female respondents in the age group of22–25 years increased their probability of employment by 24% and 11% respectively, both at– 1% significance level relative to those who were in the 15-17 years age group while male youths aged 18–22 years increased their probability of employment by 12% at a significance level of 5% relative to those who were in the 15-–years age group. Male and female youth who had primary and secondary schooling increased their probability of employment by 22% and 19% respectively at 1% significance level relative to ifthey had no formal education. Male youths with post-secondary schooling increased their probability of employment by 28% at a significance level of 1% and the female youth with the same schooling level increased their probability of employment by 11% at a significance level of 5%.

Table 6: Joint effects of cognitive (numerical literacy) and non-cognitive skills on employability

	Male	Female
	Margins (dydx)	Margins(dydx)
Numerical Literacy (Yes/No)	0.343	0.555**
	(0.318)	(0.255)
Age group (Ref = 15–17 years)		
18–22 years	0.119**	0.042
	(0.059)	(0.035)
22–25 years	0.243***	0.109***
	(0.061)	(0.037)
Education level (Ref = No formal education)		
Primary schooling	0.322***	0.117***
	(0.062)	(0.034)
Secondary schooling	0.284***	0.103***
	(0.061)	(0.032)
Post-secondary schooling	0.278***	0.109**
	(0.071)	(0.044)
Marital Status (Ref = Single)		
Married	0.155***	-0.032
	(0.043)	(0.020)
Widowed/Divorced	-0.081	0.025
	(0.157)	(0.054)
Have a child		
Yes	-0.022	0.024
	(0.039)	(0.020)
Agreeableness Score	0.011	0.006

	(0.010)	(0.009)
Conscientiousness Score	0.008	0.009
	(0.018)	(0.014)
Emotional Stability Score	-0.006	-0.004
	(0.007)	(0.006)
Extraversion Score	-0.001	0.009
	(0.011)	(0.009)
Openness Score	-0.001	0.004
	(0.011)	(0.009)
Numeracy*Agreeableness	0.006	0.000
	(0.012)	(0.010)
Numeracy*Conscientiousness	-0.003	-0.021
	(0.021)	(0.016)
Numeracy*Emotional Stability	-0.001	0.010
	(0.009)	(0.007)
Numeracy*Extraversion	-0.002	-0.007
	(0.013)	(0.011)
Numeracy*Openness	0.007	-0.003
	(0.014)	(0.010)
R-squared		
N	1139	1207
Wald test of rho=0: chi²(1)	22.10	.00691
Prob > chi²	0.0000	0.9337

* p<0.10, ** p<0.05, *** p<0.01

5.3 Discussion

For female youths, complementarities between agreeableness and cognitive skills (digital literacy) show a positive and significant effect on probability of employment (Table 3). Section 5.2 explains the probability of the youths being employed with a one-unit change in the BFI scores. The findings indicate that agreeable individuals who have higher returns to digital literacy skills would be more congenial, cooperative, approachable and would display teamwork, increasing their probability of employment. Agreeable individuals are often valued for their ability to work well with others and collaborate effectively, which can be important in many workplace environments. In addition, digital literacy skills are becoming increasingly important in many industries and job roles, as technology continues to play a larger role in the workplace. Individuals with strong digital literacy skills are often in high demand, as they can help organizations stay up-to-date with the latest technological trends and advancements. Overall, it is likely that individuals who are both agreeable and have strong digital literacy skills could have an advantage in the job market.

The direct effects of emotional stability and agreeableness show a positive and

negative significant effect on probability of employment for male youth respectively. Contrary tothese findings, emotional stability is generally considered to be a positive trait in the workplace asit can help individuals handle stress, maintain a positive attitude, and interact effectively with colleagues and customers. Employers typically value emotionally stable employees who can handle challenges and remain productive and engaged in their work. The analysis that suggests that emotionally stable men would have a lower probability of employment may be explained by specific industries or job roles where emotional stability is not as highly valued, but this would depend on the specific requirements and expectations of the job. Overall, emotional stability is generally considered to be a positive trait that can enhance an individual's employability and job performance.

Noting the importance of other factors that can influence an individual's probability of employment, the analysis carried out in this study shows that married individuals, with some levelof schooling and in their early to mid-twenties are more likely to get employment opportunities. For example, being married may indicate a sense of stability and responsibility, which can be appealing to some employers. Additionally, having some level of education can increase an individual's skills and knowledge, making them more competitive in the job market. Furthermore,being in their early to mid-twenties can be an advantage in some industries where employers are looking for young and energetic employees with fresh ideas and a willingness to learn.

Therefore, even as economists continue to advocate for curriculum reform, personality traits should not be disregarded because they are just as significant as cognitive abilities in the eyes of employers. The study by Protsch and Solga (2015) looked into the demand-side labour market's entry hiring micro-processes. The study's findings demonstrated the significance of both cognitive and personality traits in the selection criteria. The findings noted that employers preferred and placed more emphasis on personality traits signals than they would have ideally done with cognitive skills signals, which they would only use as a preliminary step to help them identify/narrow down the most qualified candidates using written application documents (school reports and grades).

5.4 Conclusions

The study suggests that for female youths, agreeableness and digital literacy skills have a positiveand significant effect on their probability of employment. Individuals who possess these traits mayhave an advantage in the job market as they are valued for their ability to work well with others and collaborate effectively. Further, they possess skills that are becoming increasingly important in many industries. However, for male youths, agreeableness and emotional stability have a positive and negative significant effect on their probability of employment respectively. Emotional stability isgenerally considered a positive trait in the workplace, but the study suggests that specific industriesor job roles may not value this trait as highly. Overall, the analysis shows that other factors, such as marital status, level of schooling, and age can also influence an individual's probability of employment. The study concludes that personality traits are just as significant as cognitive abilities in the eyes of employers, and that employers place more emphasis on personality trait signals thanon cognitive skill signals.

5.5 Recommendations

Based on the findings of the study, several policy implications can be derived:

1. Education policies should prioritize the development of digital literacy skills, especially among female youths. This can be achieved through incorporating technology-related subjects into the curriculum, providing relevant training and skills development programmes, and ensuring access to technology and the Internet.
2. Employers should consider the complementarity between agreeableness and digital literacy skills when recruiting and selecting candidates. This can be done by including personality assessments and digital literacy tests as part of the selection process, and recognizing the value of teamwork and collaboration in the workplace.
3. Policies aimed at promoting employment opportunities should consider factors such as marital status, age and education level. For example, programmes that provide support for young married couples or early-career professionals can help create more job opportunities and increase their employability.
4. Employers should recognize the importance of emotional stability in the workplace, especially for male youths. This can be done by providing support and resources to help employees manage stress and maintain positive mental health.
5. Curriculum reform efforts should not only focus on cognitive skills but also consider the importance of personality traits in the job market. This can be achieved through incorporating personality development programmes and assessments into the curriculum, and ensuring that students are equipped with the skills and attributes that employers value.

Overall, the study highlights the importance of considering both cognitive and personality traits in the job market and emphasizes the need for policies and programmes that prioritize the development ofrelevant skills and attributes among youths.

References

Alawad, A. S., Kreishan, F., & Selim, M. (2020). Determinants of youth unemployment: Evidence from Jordan. International Journal of Economics & Business Administration (IJEBA), 8(4), 152-165.

Anindo, I., M. Mugambi and D. Matula. 2016. "Training equipment and acquisition of employable skills by trainees in public technical and vocational education and training institutions"in Nairobi County, Kenya". *Training*, 3(4): 103–10.

Balcar, J. (2016). Is it better to invest in hard or soft skills?. The Economic and Labour Relations Review, 27(4), 453-470.

Beata, D.B. 2021. "The impact of macroeconomic and structural factors on the unemployment of young women and men". *Economic Change and Restructuring,* 55: 1141–72. : https.://doi.org/10.1007/s10644-021-09341-9

Bewick, V., Cheek, L., & Ball, J. (2005). Statistics review 14: Logistic regression. *Critical care*, *9*(1), 1-7.

Blair, M.M. 2012. *An Economic Perspective on the Notion of Human Capital. The Oxford Handbook ofHuman Capital*. Oxford: Oxford University Press.

Blanden, J., & Machin, s. (2010). Education and Inequality. *International Encyclopedia of Education*, 272-281.

Borghans, Lex, A. Duckworth, J. Heckman, and B.ter Weel. (2008). "The Economics and Psychology of Personality Traits." Journal of Human Resources, vol. 43, no. 4, 972–1059

Brewer, L. and P. Comyn. 2015. Integrating Core Work skills into TVET Systems: Six Country Case Studies. International Labour Organization. At https://www.ilo.org/wcmsp5/groups/public/---ed_emp/--- ifp_skills/documents/publication/wcms_470726.pdf

Clark, L. A., & Watson, D. (1999). Temperament: A new paradigm for trait psychology. In L. A. Pervin & O. P. John (Eds.), Handbook of personality (2nd. ed., pp. 399-423). New York: Guilford Press.

Dean, S.A., & East, J.I. (2019). Soft skills needed for the 21st-century workforce. International Journal of Applied Management and Technology, 18, 17–32.

Deming, D.J. 2017. "The growing importance of social skills in the labor market". *The Quarterly Journal of Economics*, 1593–1640. doi:doi:10.1093/qje/qjx022.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The Impact of Enhancing Students' Social and Emotional Learning: A Meta-Analysis of School-Based Universal Interventions. Child Development, 82(1), 405–432. https://doi.org/10.1111/j.1467-8624.2010.01564.x

Fajaryati, N., & Akhyar, M. (2020). The employability skills needed to face the demands of work in the future: systematic literature reviews. Open Engineering, 10(1), 595-603.

Farkas, G. 2003. "Cognitive skills and noncognitive traits and behaviors in stratification processes". *Annual Review of Sociology*, 29:541–62. http://www.jstor.org/stable/30036979

Goode, R.B. 1959: "Adding to the stock of physical and human capital". *The American Economic Review*, 49(2): 147–55.

Green, F (2011) What is Skill? An Inter-Disciplinary Synthesis published by the Centre for Learning and Life Chances in Knowledge Economies and Societies at: http://www.llakes.org

Greene, W.H. 2012. *Econometric analysis* (7th edn.). Prentice Hall Publishing, Pearson Education.

Heckman, J. J., Stixrud, J., & Urzua, S. (2006). The effects of cognitive and noncognitive abilities on labor market outcomes and social behavior. *Journal of Labor economics*, *24*(3), 411-482.

Holzer, H. J., & Lerman, R. I. (2015). Cognitive skills in the US labor market: For whom do they matter. *Washington, DC: AIR-PIAAC. Retrieved November*, *18*, 2016.

Ignatowski, C. (2017). What works in soft skills development for youth employment. A donors' perspective, Youth Employment Funders Group & Mastercard Foundation.

ILO (International Labour Organization). 2020. Global employment trends for youth 2020: Technology and the future of jobs. ILO. At https://www.ilo.org /wcms_737648.pdf

Kapfudzaruwa, F., M. Nagao and E. Mutisya. 2018. *Youth Entrepreneurship and Africa's Sustainable Industrialization.* Denver: Spears Media Press. At_https://books.google.co.ke/books?hl=en&lr=&id=3Gl2DwAAQBAJ&oi=fnd&pg=PA125&dq=non+cognitive+skills++studies+Kenya&ots=LIbL1ontBd&sig=9yaoi5SAbRjAbTkxh200gTXEgHk&redir_esc=y#v=onepage&q=non%20cognitive%20skills%20%20studies%20Kenya&f=fal_se

Kenya National Bureau of Statistics. (2019). *Quarterly labour force report: Quarter 4, October - December 2019*. Retrieved from https://www.knbs.or.ke/download/quarterly-labour-force-report-forth-quarter-2019/

Long, J. S., & Freese, J. (2006). *Regression models for categorical dependent variables using Stata* (Vol. 7). Stata press.

Li, G., H. Yun and W. Aizhi. 2017. "Fourth industrial revolution: technological drivers, impacts and coping methods". *Chinese Geographical Science*, 27(4): 626–37.

Laajaj, R. and K. Macours. (2019). "Measuring skills in developing countries". *Journal of Human Resources,* 56(4): 1254–95. doi: 10.3368/jhr.56.4.1018-9805R1

Ndagijimana, J., Nzasingizimana, T., & Heshmati, A. (2018). An analysis of the determinants of youth employment in Rwanda. UKH Journal of Social Sciences, 2(2), 1-10.

Nomura, S., & Adhikari, S. (2017). The influence of non-cognitive skills on wages within and between firms: Evidence from Bangladesh's formal sector. Policy Research Working Paper 8053 *https://openknowledge.worldbank.org/handle/10986/26731*. Retrieved from http://dx.doi.org/10.1596/1813-9450-8053

Otchia, C.S. (2019). "On promoting entrepreneurship and job creation in Africa: Evidence from Ghana and Kenya". *Economics Bulletin,* 39(2): 908–18. Retrieved from http://www.accessecon.com/Pubs/EB/2019/Volume39/EB-19-V39-I2-P87.pdf

Palczyńska, M. 2021. "Wage premia for skills: the complementarity of cognitive and non-cognitive skills". *International Journal of Manpower*, (42) 556–80. https://doi.org/10.1108/IJM-08-2019-0379

Protsch, P. and H. Solga. 2015. "How employers use signals of cognitive and noncognitive skills at labour market entry: Insights from field experiments". *European Sociological Review*, 31(5): 521–32. https://doi.org/10.1093/esr/jcv056

Sylvia, C., & Aisha, M. (2017). Career builders: Key components for effective global youth career workforce development. *Occasional Paper. RTI Press Publication OP-0045-1709*. North Carolina: RTI International.

United Nations Educational, Scientific and Cultural Organization. (2017). Diversifying the funding sources of TVETs. Report of the UNESCO-UNEVOC virtual conference, 16 to 22 January 2017. *UNESCO-UNEVOC International Centre for* Technical *and Vocational Education and Training UN Campus*

Weinberger, C. (2010). The increasing complementarity between cognitive and social skills. *Review of Economics and Statistics*, 92(3), 652–657. https://doi.org/10.1162/rest_a_00003

Annexes

Annex A: Variables from literature review

Author	Covariates from similar literature
Palczyriska (2021)	NCOG skills (conscientiousness, extraversion, agreeableness, openness, neuroticism); COG skills (numeracy, literacy), Demographics (years of education, age, marriage status, have children); Job characteristics (occupation, industry, tenure with current job, weekly, hours worked)
Weinberger (2010)	Participation and leadership (any leadership role, sport leadership role, student, government, other leadership role, sports participation) COG skills (math score)
Deming (2017)	Standardized cognitive, social and non-cognitive skills, age and years of completed education

Annex B: Classification of specific values and skills to the big five personality traits

	CAPABILITIES AND VALUES	BFI
	Trust	
1	Most people can be trusted	Agreeableness
2	You can only trust people you have known for a long time	Agreeableness
3	You can trust your friends to act in your best interest	Agreeableness
	Self confidence	
4	Being confident comes naturally to you	Emotional stability
5	You speak out with confidence	Emotional stability
6	You love and accept yourself exactly as you are now	Emotional stability
	Opportunism- optimistic	
7	There are many opportunities to earn a little money when you need it	Openness
8	Little hustles often come your way, because people know that you are willing to work	Openness
9	Focusing on a single job/hustle pays off better than trying to be in many different jobs/hustles	Openness
	Hope	
10	Your generation will be better off than your parent's generation	Emotional stability
11	You will be better off 5 years from now than you are today	Emotional stability
12	You achieve the goals that you set for yourself	Emotional stability
	Persistence	
13	You are discouraged when things do not work out as planned	Neuroticism
14	When you encounter difficulties, you try to find alternative ways to get to the same result	Neuroticism

15	When things do not work out as planned, you try to relax with friends or some entertainment	Neuroticism
	Dependability	
16	You always return a favor	Conscientiousness
17	You try to do what you have promised to do	Conscientiousness
18	You willingly take on work when your peers/friends are overloaded	Conscientiousness
	Openness	
19	You often come up with new ideas	Openness
20	You are curious about many different things	Openness
21	You are often the first to know how to do something in a new way	Openness
	Belief in oneself (Locus of control)	
25	It's pretty hard for your friends to get you to change your mind	Extraversion
26	You always give your true opinion in front of your friends, evenif you think they might make fun of you	Extraversion
27	You act the same way when you are alone as you do when youare with your friends	Extraversion
	Social orientation	
28	People work best under close supervision	Extraversion
29	If you could decide your future entirely on your own, your choices would be different	Extraversion
30	You are easy going, relaxed and social	Extraversion
	Loyalty	
34	It isn't an easy thing to give your loyalty to someone you don'tknow	Agreeableness
35	A friend is someone who walks into a room when everyone elseis walking out	Agreeableness
36	A person who deserves your loyalty receives it	Agreeableness
	Conviction	
37	You are in charge of your life	Emotional Stability
38	You don't need the approval of others to succeed	Emotional Stability
39	You are solution minded, and believe that any problem that comes up in life is solvable	Emotional Stability
	INTRAPERSONAL SKILLS	
40	How you look, i.e., your physical appearance (SELF-ESTEEM)	Emotional Stability
41	How you cope with your feelings (EMOTIONS)	Emotional Stability
42	How you cope with difficult situations (STRESS)	Emotional Stability

43	Knowledge of your strengths and weaknesses (SELF-AWARENESS)	Emotional Stability
	INTERPERSONAL SKILLS	
44	You do things you don't want to since many other people aredoing them (PEER PRESSURE RESISTANCE)	Extraversion
45	When you disagree with someone, you let them know in respectful manner (ASSERTIVENESS)	Extraversion
46	You ask questions to make sure you understand something someone has said	Conscientiousness
	(EFFECTIVE COMMUNICATION)	
47	You respect other people's ways of looking at things, their lifestyles, and their attitudes (INTERPERSONAL RELATIONS)	Agreeableness
48	You always show concerned feelings for people who are lessfortunate (EMPATHY)	Agreeableness
49	When you are buying something in the market, you always paythe amount the seller asks (NEGOTIATION)	Agreeableness
	DECISION MAKING SKILLS	
50	When solving a big problem, you will break it down into smaller portions (PROBLEM SOLVING)	Conscientiousness
51	You will ask questions when you don't understand something (CURIOSITY)	Openness
52	You will think of the consequences before you make any decision (CRITICAL THINKING)	Openness
0	You will look at challenges with an open mind and seek solutions from all angles (CREATIVE THINKING)	Opennnes

Mission

To strengthen local capacity for conducting independent, rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

Bringing Rigour and Evidence to Economic Policy Making in Africa

- Improve quality.
- Ensure Sustainability.
- Expand influence.

www.aercafrica.org

Learn More

www.facebook.com/aercafrica

www.instagram.com/aercafrica_official/

twitter.com/aercafrica

www.linkedin.com/school/aercafrica/

Contact Us
African Economic Research Consortium
Consortium pour la Recherche Economique en Afrique
Middle East Bank Towers,
3rd Floor, Jakaya Kikwete Road
Nairobi 00200, Kenya
Tel: +254 (0) 20 273 4150
communications@aercafrica.org