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Reducing Youths Unemployment In Nigeria: The Development of A Technical And Vocational Education And Training Survey Instrument

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To the Graduate Council:

I am submitting herewith a dissertation written by Omotola Olabisi Akinsola entitled "Reducing Youths Unemployment In Nigeria: The Development of A Technical And Vocational Education And Training Survey Instrument." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Social Work.

William R. Nugent, Major Professor

We have read this dissertation and recommend its acceptance:

Mary L. Held, Courtney Faber, Mitsunori Misawa

Accepted for the Council:

Dixie L. Thompson

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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William Nugent, Dissertation Chair

We have read this dissertation and recommend its acceptance:

Faber J. Courtney, Mary Held, Mitsunori Misawa

Reducing Youths Unemployment In Nigeria: The Development of A Technical And Vocational
Education And Training Survey Instrument

A Dissertation Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Omotola Olabisi Akinsola
May 2021

DEDICATION

This dissertation is dedicated to my husband, Dr. Oluwaseun Adeyemi, who is my rock, my greatest cheerleader, and a strong pillar of support from the very first day I told him I was going to pursue my Ph.D. Thank you for allowing me to shine and reach for the stars!

To my parent, siblings, and Ms. Ellen Parker who believed in me and my dreams even when there was no evidence or reason to do so.

To my children, Ellen and David, may this be a constant reminder that your dreams are valid and not out of reach.

To every Nigerian youth fighting for their dreams despite the realities at hand, may this dissertation be a source that light the way to help as many of you fulfill your highest potentials.

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ABSTRACT

Youth unemployment has been on the rise for many years in Nigeria. Despite the high number of youths enrolled in formal education in Nigeria and the number of graduates each year, job opportunities to absorb these graduates are few. TVET has been proposed as an educational intervention in reducing youth unemployment. A systematic review revealed that the interventions aimed at reducing youth unemployment were pooled into four categories: the use of technical and vocational education and training (TVET) in schools, the introduction of entrepreneurship education in schools, the engagement of public-private partnership (PPP), and career guidance counseling for students

In designing a survey instrument that measures Nigerian youth's perception and attitude towards Technical and Vocational Education and Training (TVET), the domains of the Social Influence theory guided the drafting of items. From an initial 25-item item list, 21 items were selected. These selected items had reliability of 0.825, with midrange item difficulty, variability, discrimination, and consistency scores. A confirmatory factor analysis showed that all the 21 items in the scale loaded significantly on the latent constructs and the model fit of the items were adequate (CFI: 0.91, TLI: 0.90, SRMR: 0.049, RMSEA (90% CI): 0.090 (0.088 – 0.097)). The Multiple Indicator, Multiple Cause (MIMIC) analysis identified differential response by gender to parental willingness to enroll children in TVET and ethnic differences in the need for TVET in universities. The CFA of the MIMIC model yielded an improved model fit (CFI: 0.91, TLI: 0.90, SRMR: 0.045, RMSEA (90% CI): 0.079 (0.075 – 0.084)).

The TVET Attitude and Practice Scale (TAPS) instrument is a theoretically driven 21-item survey instrument that can be used to assess baseline youth's attitude and perception towards TVET, and aid in the design of interventions that will reduce youth unemployment.

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CHAPTER 1

A systematic review of the educational interventional solutions for youth unemployment in Nigeria

Omotola O. Akinsola, Mary Held, Faber J. Courtney, William Nugent, Mitsunori Misawa

Abstract

Youth unemployment in Nigeria, the most populous country in Africa, has been on the rise for many years. Many youths cannot find gainful employment despite their willingness to work and make ends meet. Despite the high number of youths enrolled in formal education in Nigeria and the number of graduates each year, job opportunities to absorb these graduates are few. A systematic review of articles relating to educational interventions to reduce youth unemployment in Nigeria, published between 2010 and December 2018, was undertaken using various social science databases. There were Twenty-three papers in the review that consists of quantitative and theoretical studies. Across the studies, interventions aimed at reducing youth unemployment were pooled into four categories: the use of technical and vocational education and training (TVET) in schools, the introduction of entrepreneurship education in schools, the engagement of public-private partnership (PPP), and career guidance counseling for students.

Keyword: Youth Unemployment, Technical and Vocational Training (TVET), Entrepreneurship Education, Educational Interventions in Nigeria

Introduction

Youth unemployment, defined as young people ages 18-35 who are willing to work but not able to find gainful employment (International Labor Organization, 2019), is at an all-time high in Nigeria (Ajaegbu, 2012; Alanana, 2003; Dike, Bureau, Levine, & Okeke, 2013; Emeh, 2012). The unemployment rate in Nigeria has consistently increased from 12.31% in 2006 to 23.10% in 2018 (Trading Economics, 2019a) and the youth unemployment rate had grown from an average of 23.6% in 2016 to over 36% in 2018 (Nwogwugwu & Irechukwu, 2015; Trading Economics, 2019b). Among Nigerian youths living within urban settlements, unemployment rates are as high as 40% (Ajaegbu, 2012; Nwogwugwu & Irechukwu, 2015). With a population size of children and youths exceeding half the total population of Nigeria (Central Intelligence Agency, 2019), and a youth unemployment rate consistently on the rise, the challenges of youth unemployment in Nigeria, Africa's most populous country (Mwaniki, 2018), will evolve into an uncontrollable problem for Nigeria, Africa and the rest of the world if not addressed (Central Intelligence Agency, 2019).

Scholars have theorized different factors that have led to a high incidence of youth unemployment in Nigeria. Some of the elements include overdependence on white-collar jobs as career prospects, and lack of necessary skill sets needed by employers of labor (Dike et al., 2013; Emeh, 2012). The causes of unemployment are multi-faceted, but the Nigerian education system has been criticized for having a hand to play in the youth unemployment crisis (Dike et al., 2013). The first criticism revolves around only preparing young people to seek white-collar jobs and neglecting to train them for entrepreneurial, technical, and vocational possibilities as job creators (Agbim, Oriarewo, & Owocho, 2013). The second criticism is that the education is not up to par with the knowledge, skills, and training required at the workplace in the 21st century

(Arogundade, 2011; Emeh, 2012). Examples of some of the skill sets that are said to be missing include soft interpersonal skills, communication skills, and computer skills (Arogundade, 2011; Emeh, 2012). The third criticism is that many university graduates are unable to find jobs in their field of study (A. Adebayo, 1999; Okafor, 2011), with about seventy-one percent of university graduates in Nigeria being jobless (Onuma, 2016). Post-graduation unemployment is a challenge because seeking a university education after graduating from secondary school is seen as an excellent pathway to secure a formal (white-collar) job. The problem is further complicated because, in Nigeria, there are few universities. The ratio of the number of universities to potential applicants makes admission rates low, resulting in a competitive admission process. Hence, education, as it stands, is not going to solve the youth unemployment problem as it is currently not serving its purpose of preparing and equipping people for the world of work (Ejiogu & Nwajiuba, 2012).

With Nigeria's youth population growing at a high rate, there is a need to explore alternatives solutions to curb youth unemployment beyond the status quo route of traditional education. Over the years, entrepreneurship-based and vocational training-based interventions have been proposed as educational interventions for reducing unemployment in Nigeria (Akhuemonkhan, Raimi, & Sofoluwe, 2013; Alhasan & Iyabo, 2013; Lawal, 2014). Theoretically, entrepreneurship education and vocational training can reduce the unemployment rate, and there are shreds of evidence that suggest that these educational interventions work. Singapore's educational system has prioritized entrepreneurship education and sponsors students to study in other countries so that they can return to create jobs (M.-C. Yu, Goh, Kao, & Wu, 2017). The investment in entrepreneurship education and vocational training is reflected in the decreasing unemployment rate from 3.1% of the total workforce in 2010 to 1.8% in 2018 (CEIC,

2019; International Labor Organization, 2019). Similarly, Taiwan, a middle-income country with several universities and polytechnics like Nigeria (M.-C. Yu et al., 2017), crafted the educational curriculum to emphasize vocational training and entrepreneurship education (Akhueomonkhan et al., 2013) and saw their unemployment rate drop from 6.1% in 2010 to 3.7 in 2017 (International Labor Organization, 2019).

Singapore and Taiwan are two examples of the success of entrepreneurship education and vocational training in reducing unemployment rates (M.-C. Yu et al., 2017). With an increasing Nigerian population, it is essential to assess what has been recommended as interventions and build on current knowledge in order to identify tested practices and improve their adoption. Therefore, this systematic review aims to summarize proposed educational interventions for educational-based factors of unemployment in Nigeria and evaluate the propositions based on what has been implemented and tested.

Entrepreneurship and Vocational-Based Interventions

Educational interventions such as Technical and Vocational Education and Training (TVET) have been utilized in different countries to educate, train, and equip youths with essential and in-demand knowledge and skills needed to have a competitive edge in the global economy (Kourilsky, 1995; Witte & Kalleberg, 1995; M.-C. Yu et al., 2017). The knowledge and skills gained through TVET contribute to job creation and improvement in a country's economy (M.-C. Yu et al., 2017). Famiwole (2015) defined Technical, and Vocational Education and Training (TVET) as the segment of learning that introduces youth to the acquisition of skill sets that are utilized for self-employment creation or paid employment in various industries and professions. Vocational based interventions like TVET incorporates active learning that equips students with hands-on skills that are marketable to employers (Ajufo, 2013). Entrepreneurship

Education (EE), defined as training that enhances self-reliance and self-employment among university graduates (Akpan & Etor, 2013), is a component of TVET (McCallum, 2019; United Nations Educational Scientific and Cultural Organization, 2019). Suleiman (2016) defined entrepreneurship as the willingness and ability of an individual to identify an economic need, seek investment opportunities to establish and run a business successfully. Entrepreneurship can lead to the development of small, medium, and large-scale businesses. Successful entrepreneurial endeavors result in an improvement in the nation's economy, which leads to a decrease in the poverty rate and an increase in job opportunities (CGE Salami, 2011b).

Review of Educational Interventions

TVET, along with EE, are educational interventions that have been promoted and utilized in developed countries such as the United States, Germany, and China to tackle youth unemployment (Ueno, Kimura, Neudorfer, & Maclean, 2004; X. Yu, 2005; Zirkle & Martin, 2012). These educational interventions are used to educate, train, and equip youth with essential and in-demand knowledge and skills needed to have a competitive edge in the global economy. Studies in Asian countries such as China and Malaysia show the value of TVET in reducing youth unemployment. In China, TVET has been incorporated into the different institutions of learning to equip young people with the knowledge, training, and skillsets needed to become economically productive (Li, Millman, Matlay, & Liu, 2008). In Malaysia, exposure to TVET increased the interest of young people in creating businesses to curb the issue of unemployment (Ibrahim & Bakar, 2015).

The German vocational education system is highly praised worldwide for enabling the creation of a skilled workforce while helping young people transition from school to work (Witte & Kalleberg, 1995). The vocational education system has been said to produce over 600,000

quality skilled laborers trained in hundreds of different professions in ten years (Witte & Kalleberg, 1995). The unique set up of the German vocational education system is the balance it has between learning theories and skills in a school setting and using the methods and skills learned in a work setting. Like the United States, the unemployment rate has consistently reduced in the last ten years, from 6.9% to 3.7% (International Labor Organization, 2019). In China, vocational and entrepreneurship education was used to equip young people with the knowledge, training, and skillsets needed to become economically productive, which led to increasing small businesses who are now employers of labor (Li et al., 2008). Wang and Jiang (2013) discussed the influence of Germany's dual education model on China's vocational education and training model. Hao (2012) stated that vocational education and training has been very instrumental in China's education system and has led to a boost in employment opportunities, economic growth, and social development. In the last 20 years, the unemployment rate in China had remained in the range of 4.5% to 4.7%. The evidence from these developed countries suggests that educational interventions (entrepreneurship education and technical and vocational education) can be useful tools that can reduce youth unemployment and increase the economic productivity of a nation.

Purpose of this Study

This review explores and examines proposed educational interventions that can be used to improve youth employment possibilities in Nigeria. With Nigeria having a large youth population, it is crucial to evaluate approaches to solve youth unemployment. Youth employment can potentially improve the economy of Nigeria; hence, it is essential to review what Nigerian researchers and scholars have proposed or study regarding ways to tackle the youth unemployment problem in Nigeria. Knowing what has been considered or recommended can

provide insights and guidance for the direction of future studies. For this review, educational interventions are any initiatives or programs or strategies that can enhance the chance of being gainfully employed. The research question guiding this systematic review is, are the educational interventions that have been proposed or recommended in reducing youth unemployment in Nigeria?

Methodology

This study is a systematic review of proposed educational interventions to reduce youth unemployment in Nigeria. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed to report the findings in this review (Moher, Liberati, Tetzlaff, Altman, & The, 2009).

Eligibility Criteria

Papers that addressed youth unemployment and gave propositions on educational interventions to reduce youth unemployment in Nigeria were selected. Articles that focused on unemployment among Nigerian youths, defined as any Nigerian between the age of 18 and 35 (National Youth Policy of Nigeria, 2001), were included in the search. This review was limited to peer-reviewed articles published between January 2010 and December 2018 in any of the following databases: PsycINFO (ProQuest), CINAHL Complete (EBSCO), Academic Search Complete (EBSCO), Business Source Complete, Education Source, ERIC, and Scopus.

Search Strategy

Search strings were developed to test run these databases (PsycINFO (ProQuest), CINAHL Complete (EBSCO), Academic Search Complete (EBSCO), Business Source Complete, Education Source, ERIC, and Scopus) one of the databases (Scopus) produced no result. A web-based application of Endnote (Clarivate Analytics, 2018), was utilized to sort and store all the journal articles generated from the search strings. This tool allowed for ease in

trimming out duplicates in addition to finding and collecting full-text articles and collecting references in folders. Materials that were not available through Endnote were searched for through the university library online database and Google scholar and uploaded to EndNote. The researcher created search strings that were used in all the social science databases. Two phases of data reviewing were conducted for this study, phase one involved searching for articles using social science databases, and phase 2 was through google scholar.

Phase 1: Social Science Databases

PsycINFO (ProQuest), CINAHL Complete (EBSCO), Academic Search Complete (EBSCO), Business Source Complete, Education Source, and ERIC database searches were performed for Phase I. Boolean terms and find any of my search terms were used to identify studies meeting the criteria. The search strings were as follows: (Entrepreneurship education OR entrepreneurship training OR entrepreneurship tutelage or entrepreneurship teaching or entrepreneurship guidance or entrepreneurship instruction) AND (Unemployment OR Jobless OR Unemployed OR Joblessness) and Nigeria; (Vocational Training OR skill acquisition OR skill training or technical training) AND (Unemployment OR Jobless OR Unemployed OR Joblessness) AND Nigeria; and (Workforce development or employment development OR employment creation OR job creation OR Job readiness OR Job preparation) AND (Unemployment OR Jobless OR Unemployed OR Joblessness) AND Nigeria.

Phase 2: Google Scholar

The researcher used Google Scholar to search for articles to be thorough. The search string developed for Google Scholar was: educational strategies to reduce youth unemployment in Nigeria. For the Google Scholar database, there was no way to guarantee if the articles were peer reviewed or not.

Search Databases

Using the Boolean terms, 69 articles were returned from the following databases: PsycINFO (ProQuest) i.e. (n = 8), CINAHL Complete (EBSCO) (n = 16) Academic Search Complete (EBSCO) (n = 12), Business Source Complete (n = 17), Education Research Complete (n = 6), and ERIC (n = 10). Phase II included preliminary distillation of the articles by eliminating duplicates (n = 13), wrong topics (n = 36), and country (n = 5). Hence, the remaining articles (n = 13) satisfied the eligibility criteria. The Google Scholar search resulted in 16,300 articles. The parameters utilized with the search string include: 1) Sort by relevance, 2) excluded patents and citations, 3) from 2010 -2018, and 4) English Language article only. The researcher chose to import the first ten pages of the results from Google Scholar into EndNote. The decision was made because only the first ten pages of the search results had relevant articles. The total number of articles imported to EndNote from Google Scholar was 200). The inclusion and exclusion criteria were followed, and it generated 1 duplicate (n=1), 158 wrong topics (n= 158), and 31 articles in a country other than Nigeria (n= 31). Hence, the remaining articles (n=10) satisfied the eligibility criteria. A total (n=23) articles were included in this review after combining eligible articles from the social science database to the eligible articles from Google Scholar.

Screening Articles

Articles were screened to ensure they met the predetermined inclusion and exclusion criteria for the study by reading the titles, abstracts, and full articles. The researcher also identified the types of articles included in the review.

Data Abstraction

The researcher extracted studies that were eligible for the review and classified into the type of methods utilized: quantitative and theoretical studies. The researcher abstracted the study

designs, sample populations, predictor variables, study outcomes, and regions in Nigeria, where the studies took place from the quantitative articles. For theoretical studies, the following were abstracted: definitions of concepts, factors contributing to youth unemployment, and the proposed interventions stated by the authors. Figure 2 below showed the 3-step data extraction process.

Results

Of the 23 articles that met the eligibility criteria, three were quantitative, while 20 were theoretical. Of the three quantitative articles in the review, one was carried out in the south-south region of Nigeria, while the remaining two articles occurred in the south-west part of Nigeria (Table 1-1). Of the three quantitative articles, job creation and unemployment were either the only outcome variables (Akpan & Etor, 2013; Olajide, 2015) or one of the outcome variables that were assessed (Hassan, 2013). All three articles were cross-sectional studies (Akpan & Etor, 2013; Hassan, 2013; Olajide, 2015). Two of the studies (Hassan, 2013; Olajide, 2015) took place in the South-West Region of Nigeria, and the participants were students with sample sizes of 220 and 78, respectively. One study (Akpan & Etor, 2013) took place in the South-South region of Nigeria and had over 480 participants who were lecturers or instructors at four different universities in Nigeria.

The authors listed various factors contributing to youth unemployment in the theoretical papers (Table 2). The most common elements were: Inadequate education system (outdated curriculums, lack of entrepreneurship education and TVET) (Adegun, 2013; Ajufo, 2013; Onuma, 2016; CGE Salami, 2011a; CGE Salami, 2013), Lack of economic growth and development, High population growth, Lack of employability skills, Political instability, and high rural-urban migrations (Ajufo, 2013; Hassan, 2013; Olajide, 2015; CGE Salami, 2011b;

Uddin, 2013). Four interventions were proposed that include: Career guidance counseling, entrepreneurship education, a public-private partnership, and technical and vocational education and training (TVET).

Entrepreneurship Education

With regards to entrepreneurship education (EE), some expert opinion studies proposed that EE should be incorporated into classes as early as primary school level (Adegun, 2013; Aja-Okorie & Adali, 2013), and EE should be made a distinct subject at the secondary school level (Aja-Okorie & Adali, 2013; Ajufo, 2013). Infusing EE into primary school classes will create an opportunity for pupils to learn basic skills (Aja-Okorie & Adali, 2013). At the secondary school, entrepreneurial-related subjects can be taught, and this will expose the students to the demands of entrepreneurial training (Aja-Okorie & Adali, 2013) and students will have less difficulty taking such courses at more advanced levels such as the Polytechnique or universities (Aja-Okorie & Adali, 2013; Ajufo, 2013). Additionally, these expert opinion studies suggested that EE should be incorporated across all universities within Nigeria (Maina, 2014) as they are the tools of youth employment and empowerment (Maina, 2014; Nkechi, Emeh Ikechukwu, & Okechukwu, 2012), poverty eradication (Adegun, 2013; Maina, 2014), and economic development (Maina, 2014; Nkechi et al., 2012; CGE Salami, 2011b).

A study carried out by Akpan and Etor (2013), with a sampling frame of 4,784 lecturers and instructors in the south-south region of Nigeria, assessed the relevance of entrepreneurship education in job creation using the "Perception of Entrepreneurship Education for Graduate Self-employment Questionnaire." The ten items in the survey were measured on a 5-point Likert scale (Strongly agree to strongly disagree), and all the 480 respondents had mean scores above 2.50, suggesting that EE is relevant to graduate self-employment (Akpan & Etor, 2013). This study

was limited by failing to provide the proportions of responses and significance of the responses to the measured construct, perception towards EE. Additionally, Hassan (2013) conducted a study among 220 undergraduate students in the south-west region of Nigeria regarding the perception of entrepreneurship development through education in curbing youth unemployment and employment opportunity generation. The results reported showed that the majority of the respondents agree that entrepreneurial development is a solution to unemployment problems, that there is some association between entrepreneurship and employment opportunities, and that entrepreneurial businesses have high chances of succeeding (Hassan, 2013).

Additionally, the majority of the respondents agree that there are challenges in developing entrepreneurial education in Nigeria, and that Nigerians participate in entrepreneurial business to a low extent and that the government has not effectively created an enabling entrepreneurial environment (Hassan, 2013). Although a substantial proportion of the respondents agree on these items associated with EE, the significance was not reported, and an association of these measured items on the perception of EE cannot be determined. Despite these weaknesses, Akpan and Etor (2013) proposed the inclusion of entrepreneurship learning into all school curriculums across Nigeria, while Hassan (2013) recommended entrepreneurial programs and curriculums should be imbibed into all university education (Table 1-3).

Across the studies, the specific entrepreneurial skills needed include information technology skills (Akpan & Etor, 2013; Nkechi et al., 2012; CGE Salami, 2011b), financial management skills (Akpan & Etor, 2013; Maina, 2014), risk-taking skills (Aja-Okorie & Adali, 2013; Akpan & Etor, 2013; Maina, 2014), communication skills (Akpan & Etor, 2013; CGE Salami, 2011b), motivation skills (Aja-Okorie & Adali, 2013; Akpan & Etor, 2013), marketing skills (Akpan & Etor, 2013; CGE Salami, 2011b), time management skills (Akpan & Etor,

2013), problem-solving skills (Akpan & Etor, 2013; Maina, 2014; CGE Salami, 2011b), creativity & innovation skills (Aja-Okorie & Adali, 2013; Akpan & Etor, 2013; Maigida, Saba, & Namkere, 2013), and human relations skills (Akpan & Etor, 2013; Maina, 2014), leadership skill (Ajufo, 2013; Akpan & Etor, 2013; Maigida et al., 2013; CGE Salami, 2011b) (Table 1-3).

Public-private Partnership and Career Guidance Counselling

The private-public partnership was proposed by one article as an intervention to reduce youth unemployment in Nigeria. According to Adebayo & Ayegbusi (2017), investment in public-private partnership (PPP) between government and private companies can gear up job creation in various sectors within the economy leading to employment opportunities for young people. The PPP can be in various forms in which the private provides capital investment for the production of goods and rendering services, and the government provides some level of support ranging from tax breaks to annual grants and subsidies (F. A. Adebayo & Ayegbusi, 2017). This expert opinion paper suggested that PPP will thrive in the agricultural, tourism, health, educational, transportation, small scale industries, and commercial sectors of the Nigerian economy (F. A. Adebayo & Ayegbusi, 2017). The authors identified employment opportunities that will emerge from PPP, which includes specialized cash crop farming and animal husbandry, the creation of processed farm produce such as cocoa drinks, oils, yam, cassava, and plantain flour, and community-based transportation systems (F. A. Adebayo & Ayegbusi, 2017). Additionally, PPP will boost student internship experiences, while creating avenues for employment opportunities through the creation of more clinics and hospitals, as well as tourism and recreational centers (F. A. Adebayo & Ayegbusi, 2017).

Another intervention suggested by one article was career guidance counseling. Ajufo (2013) advocated for career guidance counseling to be made compulsory for all students at all education levels. This expert opinion paper argued that career guidance could address the imbalance in the demands in the labor market and the products of the educational institutions by advising students on the course of study and occupational choices (Ajufo, 2013). Career guidance will instill confidence in students on their chosen paths while generating positive attitudes towards occupations that the students have aptitude, skill, and interests in doing (Ajufo, 2013). This positive attitude will result in more students being involved in occupations that are their areas of strength and making them self-reliant (Ajufo, 2013). The potential effect of the career guidance of students will reduce job unemployment from diversified occupational interests (Ajufo, 2013). The author also suggested, this career guidance should not be taken in isolation but should be in conjunction with TVET and EE (Ajufo, 2013).

Technical and Vocational Education and Training

Concerning TVET, some expert opinion studies suggested that such training should be introduced at all levels of education (Ajufo, 2013) or specifically at the tertiary educational level (Maigida et al., 2013; Ogbunaya & Udoudo, 2015; Olajide, 2015). The rationale for these suggestions was that the early introduction of TVET to students would encourage young people to be self-reliant and business creators (Ajufo, 2013). Additionally, secondary school students will possess the skills needed to be technicians rather than only focused on obtaining a university degree (Ajufo, 2013). Incorporating TVET into university courses will provide technical skills to university graduates that will make them job creators or self-employed rather than depending on public-owned jobs (Maigida et al., 2013). Additionally, the introduction of TVET into universities will encourage the documentation of skills needed in the labor market, merging the

training centers to job centers, and encouraging internships and apprenticeship (Maigida et al., 2013; Ogbuanya & Ofonmbuk, 2015; Olajide, 2015). TVET will create a platform for interaction between universities, polytechnics and technological schools (Olajide, 2015) and reduce the negative attitude towards TVET (Ajufo, 2013) while encouraging out-of-school students to seek training before getting enrolled in a university (Ajufo, 2013; Maigida et al., 2013). Incorporating TVET into secondary schools or tertiary institutions will require an integration of TVET into the curriculum (Olajide, 2015; Onuma, 2016), and create a need for TVET-trained teachers (Ogbunaya & Udoudo, 2015; Olajide, 2015), and an opportunity for private partnership in the investment in TVET programs (Ogbuanya & Ofonmbuk, 2015).

In assessing the perception of TVET stakeholders on how TVET can reduce unemployment, Olajide (2015) reported the proportions of agreeability of respondents to items assessing how TVET can reposition the education system in Nigeria. Most of the respondents agree that there is a mismatch between the labor needs in the industry and people trained in TVET and that there is the inadequate financial allocation and infrastructural support for TVET. About 96% of the study participants believe that TVET can be the solution to eradicating youth unemployment in Nigeria however, 88% of the respondents believe that the TVET curricula are due for review and 85% of respondents to agree that TVET is poorly funded in Nigeria (Olajide, 2015). The author, therefore, recommended adequate funding for the TVET program and integration of TVET into the education system (Olajide, 2015).

Quality of Evidence

Overall, the papers included in this systematic review are limited by various factors, which range from lack of peer review designation for some articles in this study to lack of a theoretical or conceptual framework for most of the theory articles (Tables 1-4a, 1-4b, and 1-4c).

There were only three quantitative studies in this review, and they were limited to just two regions in Nigeria out of six regions. Hence, the results from their findings cannot be generalized across Nigeria. Some of the quantitative studies did not have clearly defined research statements, objectives, or hypotheses, while others did not clearly explain the methodology utilized for their studies. An example of the study by Olajide (2015), which did not state the research questions or hypotheses; hence, what was being studied could only be inferred. All the quantitative studies were only one type of research design; there was no variety in terms of research design. The lack of diversity in research design makes the findings from the studies not as empirically sound as it can be. Most of the research questions asked only asked about the opinions of participants regarding the concepts and proposed interventions. No actual studies to test the effectiveness and fit of the proposed interventions were done.

The lack of effectiveness testing is a significant gap in the current literature available; it is not enough to seek the perception or opinions regarding proposed interventions. More studies with a higher level of evidence are needed to test the strength of the proposed interventions in curbing youth unemployment in Nigeria. Although there were 20 theoretical papers in this review, none of them had a theoretical framework to guide the proposed recommendations they suggested. The majority of the papers focused on concept definitions for various concepts such as unemployment, youth unemployment, entrepreneurship, entrepreneur, entrepreneurship education, technical and vocational education, and training. Most of the ideas were not linked to a theoretical framework or conceptual models that could have shown the interactions and relationships between the problems identified and the proposed interventions. Empirical data were lacking in most of the theoretical papers, and hence it was hard to know if most of the

factors regarding youth unemployment and the consequences youth unemployment leads to are accurate.

Discussion and Implications

This review summarized the proposed educational recommendations for tackling youth unemployment in Nigeria. The four proposed solutions were career guidance counseling (CGC), entrepreneurship education (EE), public-private partnership (PPP), and technical and vocational education and training (TVET).

Career Guidance Counselling (CGC)

Practical career guidance was recommended to guide students in pursuing a career path that aligns with their talents and available jobs in the labor market (Ajufo, 2013). The author proposed that a merge between vocational guidance and educational guidance will result in effective career guidance. Maguire and Killeen (2003) attested that effective career guidance helps students to be prepared for the job market while in school. Practical career guidance can, therefore, correct the mismatch between the skillset youth have after graduation and the need in the labor market. Hooley and Dodd (2015), in discussing the economic benefits of career guidance in England, opined that while career guidance provides human capital by guiding their choices to building skills that are best suited for them, it aids the development of a diverse pool of skillset, which will lead to decreased unemployment, increased economic outcomes to the individual. Additionally, the community will benefit from having increased tax revenue, decreased crime, improved community productivity, improved living standards, and health outcomes (Hooley & Dodd, 2015).

Entrepreneurship Education (EE)

Findings from some of the studies suggested that entrepreneurship education can reduce not only youth unemployment but can lead to employability skills for youth for employment

opportunities as well as self-employment (Akpan & Etor, 2013; Hassan, 2013). Several authors advocated for the integration of entrepreneurship education into different levels of the Nigerian education system (Adegun, 2013; Maina, 2014; Okoye & Udoudo, 2015; CGE Salami, 2013). Based on these findings and recommendations, policymakers in Nigeria should consider the incorporation of entrepreneurship education in any or all the educational levels. Studies should be conducted to determine the ideal education level to introduce entrepreneurship education in Nigeria.

Beyond incorporating entrepreneurship education into the education system, several authors suggested the provision of financial capital in the form of either loans or credits, start-up funding or state-wide innovation funds for aspiring young entrepreneurs to start their ventures (Abimbola, Donatus, & Olowu, 2016; Adegun, 2013; Audu, Kamin, & Balash, 2013; Maina, 2014; Ojeifo, 2013; Okoye & Udoudo, 2015). The funding recommendations are a critical component in fostering entrepreneurship development through education among young people in Nigeria. Having access to financial capital is one of the crucial steps in nurturing entrepreneurship prospects among youths (Chidiebere, Iloanya, & Udunze, 2014). Having access to capital is a powerful incentive for youths to become job creators, thus reducing youth unemployment (Chidiebere et al., 2014; Nkechi et al., 2012).

Public-Private Partnership (PPP)

The presence of the public-private partnership (PPP) was proposed as an intervention to curb youth unemployment (F. A. Adebayo & Ayegbusi, 2017), and foster job creation in Nigeria (Ajufo, 2013; CGE Salami, 2011b). Ogbunaya and Udoudo (2015) suggested creating a school-to-work pipeline, a practical example of PPP, in which companies partnered with the educational sectors and enrolled students can work for a company while still at school. This form of

partnership enhances skill sets of the students and provides practical experience that they can use by the time they finish school. There are some of evidence that PPP can solve unemployment issued if handled appropriately. PPP in the Netherlands involves a triad of public authorities, private businesses, and schools, and the partnership is characterized by the government providing subsidies for innovative projects that will support the employment of youths (Van der Meer, Muffels, & Bekker, 2017). This innovative partnership led to a reduction in youth unemployment rates in the Netherlands (Van der Meer et al., 2017). Also, Avina and Russell (2016) reported the influence of the Public-Private Partnership between private Information Technology firms and the government in the Middle East and North Africa counties, which resulted in the provision of jobs to 13 million youths in the region within two years.

Technical and Vocational Education and Training (TVET)

Technical and vocational education & training (TVET) was another proposition that can reduce youth unemployment in Nigeria. Olajide (2015) argued that TVET could be the solution to youth unemployment when there is adequate investment in TVET. With TVET, youth can be trained to have expertise in various fields, and they can be job creators and employers of labor. Similar to entrepreneurship education, TVET has been advocated to be introduced into different educational levels and school curriculums across Nigeria (Ajufo, 2013; Maigida et al., 2013; Onuma, 2016). In achieving this, there is a need to change the perceptions and mentality of Nigerians regarding working pursuing TVET as a career path. As noted by Audu et al. (2013) and CGE Salami (2011a), negative perceptions about TVET can be a barrier in the integration and adoption of TVET into the educational curriculum. In counteracting these negative perceptions, Witte and Kalleberg (1995) suggested making TVET certificate worthy.

Moses (2019) advocated for increased awareness of TVET programs and potentials among youths and parents to address misconceptions about TVET while identifying the potential benefits. TVET. The Philippines Technical Education and Skill Development Authority (TESDA) serves as an example of how awareness of the benefits of TVET can change youths' attitudes toward TVET (Philippine Technical Education and Skills Development Authority, 2010). Using the social marketing and advocacy program, TVET was marketed to Filipino youths and families, and there was evidence of increased TVET enrollment among the youth population (Moses, 2019; Philippine Technical Education and Skills Development Authority, 2010).

The implication of TVET, EE, PPP and Career Guidance Interventions

TVET, EE, Career guidance, and PPP can potentially reduce youth unemployment by reducing the youth's dependence on the government for jobs and increasing the self-employment ratio among Nigerian youths. The implication of these recommendations will be relevant at the national level, at the organizational level, and the individual level. At the national level, an effective TVET, EE, PPP involvement, and career guidance for students can collectively reduce unemployment rates in the country, increase private business ownership, expand small and medium enterprises in Nigeria, and reduce poverty rates in the country. Additionally, crime rates will reduce, the living condition will improve, and health indices of the nation will improve. At the organizational level, there will be increased value on technical and skill-based learning, and faculty in TVET institutes will be accorded equivalent remuneration. The educational curricula might be modified to accommodate TVET and EE while creating innovative ways to teach TVET and engage PPP in academia. There will be an increased need for TVET instructors in various educational domains. Career guidance will be enriched by a larger pool of courses and

job options. The industry will seek to employ from the university, and technical colleges as the products from these institutes will be a good fit.

At the individual level, the availability of scholarship, internship experience, and awareness of the financial benefits, risks, and available support of being self-employed can potentially change the poor attitude and perception of TVET among Nigerian youths. An effective change in the attitude and perception toward TVET will encourage out-of-school students to seek TVET training while waiting for admission into tertiary institutions. At the same time, undergraduates will be exposed to alternative employment routes rather than focusing on the government. Unfortunately, none of the studies quantitatively showed any relationship of these proposed interventions on youth unemployment reduction. Research should drive innovation, and there is a considerable need for cross-sectional, cohort, and longitudinal studies that will assess the potential impact of these interventions.

Gaps in Literature

This review identifies gaps in knowledge that can serve as points for intervention. It is unknown if TVET and EE can work, considering Nigeria's political climate. Policies that work in one country do not necessarily have to work in another country. Despite the immense burden of unemployment, there is yet to be any study that evaluated, quantitatively or qualitatively, the direct or indirect impact of EE or TVET. The theoretical papers have justified the usability of TVET and EE as a solution. However, no empirical evidence supports the theoretical framework. The role of perception towards TVET and EE affects attitude, intent, and action. However, there are no studies that examined the impact of perception of youths towards TVET and EE, hence predicting the likely adoption of the practice, even if there is a political will to introduce EE and TVET in Nigerian schools. Creating interventions for youths without assessing the knowledge

and attitude of youths towards the planned intervention might result in a failed intervention. Future studies should be designed around youths and assess the pattern of adoption of new behaviors and practices among them while predicting the likelihood of success of related interventions if introduced.

Limitations

The systematic review is limited in several ways. There is a lack of peer-reviewed, qualitative, and quantitative articles on this issue. The possibility exists that some relevant articles were not published in the databases used in this review, but the addition of Google Scholar helped limit such exclusions. The quantitative studies in this review were carried out in two out of six regions in Nigeria. Hence, the findings from these studies may not be generalizable across Nigeria. Despite these limitations, this review successfully identifies propositions to reduce youth unemployment in Nigeria and serves as a template that future studies can reline in evaluating interventions that will reduce unemployment.

This study reviewed papers, which have low levels of evidence. Using studies with low levels of evidence to identify areas for intervention can be fundamentally flawed as theoretical propositions do not translate into practice linearly. However, this review has, within the ambits of the information available, synthesized the proposed interventions, and assessed the outcome of quantitative studies in presenting areas where intervention might be applied. Further studies need to test the synthesis of these interventions empirically before adopting it into practice.

Conclusion

Youth unemployment is a chronic issue in Nigeria. Propositions to reduce youth unemployment centers on entrepreneurship education, technical and vocational education and training, career guidance, and the involvement of Public-Private Partnership. Evaluating the

validity of these proposed educational interventions is the next step towards solving this problem. Furthermore, the Nigerian government can take a cue from other developed countries such as China, Germany, Korea, and the Netherlands to learn how to incorporate the best alternative pathways that will provide job opportunities for young people to excel, which will also improve the economy.

CHAPTER 2

Development of Survey Instrument in Evaluating Nigerian's Youth Attitude and Perception of Technical and Vocational Education and Training

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Abstract

TVET has been proposed as an educational intervention in reducing youth unemployment. There is no publicly available survey tool that measures youths attitude and perception towards TVET. In the development of a measure of the perception and attitude towards Technical and Vocational Education and Training (TVET), the domains of the Social Influence theory guided the drafting of items. Items were crafted to assess the perceived importance of technical and vocational education, the role of parents and peers in the attitude and perception of TVET, and the perceived benefits the TVET skills will provide. Content validity, item readability and appropriateness, and item analysis were used to assess the suitability of the items in the scale. From an initial list of 25 items, 21 items were ultimately selected for inclusion on the scale. The estimated reliability of scores on this scale in a pilot study was 0.825. The results of an item analysis showed the items with midrange item difficulty, variability, discrimination, and consistency scores. The TVET Attitude and Practice Scale (TAPS) instrument is a theoretically driven 21-item survey instrument that can be used to assess youths' attitudes and perceptions towards TVET, and aid in the design of interventions created to reduce youth unemployment.

Introduction

Technical and Vocational Educational Training (TVET) refers to professionally-oriented tutelage that culminates in the engaged individuals developing pedagogical knowledge and relevant skill sets (Cornelius & Stevenson, 2018). In Africa, TVET refers to formal and informal learning experiences, targeted at equipping individuals to either be self-employed or to be employable (Zideman, 2003). It involves developing the skills needed to practice specific occupations (Oketch, 2007). In Nigeria, and most of the other countries in Sub-Saharan Africa, TVET starts at the secondary school, and there are post-secondary formal and informal educational institutes that train graduates of secondary schools on specific vocational skills (Dike, Bureau, Levine, & Okeke, 2013). This educational path is terminal and leads directly to blue-collar job acquisition (A. Adebayo, 1999; Okafor, 2011). An alternative educational route involving obtaining graduate education can lead to more lucrative white-collar job acquisition (Emeh, 2012). Coupled with economic instability, inconsistent policies, and an ever-growing pool of unemployed graduates from tertiary institutions, TVET has grown in importance, and has been put forth as a possible solution to unemployment (A. Adebayo, 1999; Dike et al., 2013; Okafor, 2011).

It has been suggested TVET can reduce unemployment (Akhuemonkhan, Raimi, & Sofoluwe, 2013; Alhasan & Iyabo, 2013; Lawal, 2014). While TVET provides individuals with employability and occupational skills, it also offers employers a labor trained workforce and a reduced need for outsourcing or recruitment of foreign-trained skilled workers (Hoeckel, 2008). TVET also provides an opportunity for individuals to be self-employed and increase the pool of entrepreneurs in the country (X. Yu, 2005). Though unemployment is associated with social isolation, poor self-esteem, aggressive behaviors, depression, and social vices, TVET offers a

source of income, social esteem as an employer of labor, and diverse occupational paths.

Whereas these employer-based and employee-based benefits are motivational factors for prioritization of TVET, uptake of TVET and utilization of knowledge are fundamental issues that need to be addressed. Creating vocational institutes does not translate into uptake by youths, especially if TVET as an educational path is viewed as being inferior to tertiary education, and working as a white-collar employee is prioritized over being self-employed or an employer of labor (A. Adebayo, 1999; Okafor, 2011).

Statement of Problem

Assessing youth perception of TVET remains a crucial factor in making policy decisions. While some authors have demanded that TVET should be introduced into tertiary education (Adegun, 2013; Aja-Okorie & Adali, 2013) and others have called for a public-private partnership to boost funding for TVET (F. A. Adebayo & Ayegbusi, 2017; Ajufo, 2013), uptake of such services by youths is assumed to respond to these changes. Although these suggestions can potentially reduce unemployment and increase TVET uptake, objectively assessing the perceptions of Nigerian youths towards TVET is an important first step towards designing interventions targeted at youth's unemployment.

Rationale for Development of Survey Instrument

Assessing perception is an objective way of measuring what is known, reveal misconceptions, establish a baseline on which the impact of an intervention can be assessed, and design an appropriate intervention for the identified population (Gumicio et al., 2011). An objective assessment of the youth's perception of TVET requires an appropriate measurement instrument. While measurement tools exist to measure the perception of TVET in developed

countries, to the best of the author's knowledge, there is no publicly available measurement instrument created to measure youths' perception towards TVET in Nigeria.

The aim of this study was to develop a draft of an instrument that measures Nigerian youths' perceptions and attitudes towards TVET and assess the content validity of the items. Secondly, this study obtained assessments concerning the readability and appropriateness of the items. A third study goal was an item analysis, the results of which could be used to delete any poorly functioning items from the measure and arrive at a final version of the measure.

Theoretical Framework

In designing the items of the survey, Social Influence theory was used as a theoretical framework. The Social Influence theory is an individual level theory that describes how the social network influences an individual's perceptions, attitudes, behaviors or reaction influences (Li, 2013). Social influence theory, first described by Kelman (1958), describes how attitude and perception is influenced through compliance, identification, and internalization (Kelman, 1958). Compliance refers to the acceptance of an external influence (Kelman, 1958), which then shapes the individual's perception and influences behavior (Goldsmith & Goldsmith, 2011). Identification refers to the influence of people in the individual's social network that induce attitudinal change (Kelman, 1958). Internalization refers to the acceptance of norms from an observation of the potential benefit such norms will provide (Kelman, 1958). Social influence theory has been used in several studies to understand how an individual adopts a norm, behavior or a practice. Hwang (2016) used the domains of social influence theory (compliance, identification, and internalization) to assess attitudes towards knowledge sharing on e-learning platforms. Li (2013) used a combination of social influence theory and the elaboration likelihood

model to assess the influence of persuasive information on social influence, affective and cognitive response and how social influence mediates the cognitive and affective responses and behavior intention.

Social influence theory provides the basis for understanding how a form of education such as TVET can be adopted and used, both at the individual level and at the community levels (Goldsmith & Goldsmith, 2011). Within the domain of TVET, compliance, a measure of relative importance of the norm (Kelman, 1958), is a reflection of youths' perceived importance of learning technical and vocational skills. Identification, a measure of the relative power of the influencing agent (Kelman, 1958), is a reflection of the role of parents and peers in inducing youths' perceptions and attitudes towards TVET. Internalization, a measure of the potential benefit of the norm (Kelman, 1958), is a reflection of a self-reported perceived benefit of TVET in job security, job creation, and the reduction of unemployment. Conceptually, compliance, internalization, and identification exert combined effects in shaping youths' attitudes and perceptions towards TVET (Figure 1).

Methods

Scale Development

An initial draft of a scale named the TVET Attitude and Perception Scale (TAPS) was composed, guided by a review of the theoretical recommendations on TVET in Nigeria (Akinsola, Held, Courtney, Nugent, & Misawa, Unpublished). This 25-item self-report instrument was designed to measure the perceptions and attitudes of Nigerian youths towards TVET by assessing the perceived importance of learning technical and vocational education (Maigida, Saba, & Namkere, 2013; KR Okoye & Udoudo, 2015; CGE Salami, 2011a), the influence of parents and peers on youths attitude towards TVET (Maina, 2014; CGE Salami,

2011b), and the perceived benefits of having entrepreneurship and vocational skills (Ogbuanya & Ofonmbuk, 2015; KR Okoye & Udoudo, 2015). It was constructed using a 5-point Likert Scale scaling ranging from Strongly Agree (1) to Strongly Disagree (5). The range of item content captured widely held beliefs and opinions on how TVET relates to formal education, skill development and job opportunities, parental influence, government and non-governmental participation, and social stigma (Akinsola, Held, et al., Unpublished). As initially designed, the total scores could range from 25 to 125, with lower scores indicative of more positive attitudes towards TVET and vice versa.

In measuring the perception and attitude towards TVET, the domains of the Social Influence theory guided the drafting of items, with items crafted to assess the perceived importance of technical and vocational education, the role of parents and peers in the attitudes and perceptions of TVET, and the perceived benefits the TVET skills will provide. Items in the TAPS that assess the perceived importance of technical and vocational education ask the respondents the necessity of TVET in secondary school, universities, polytechnic and their perception of the equivalence of TVET training to degrees from formal institutions. Items in the TAPS that assess the perceived benefits the TVET skills will provide measure the agreeability of the respondents on how TVET helps in starting self-owned business, serve as a back-up plan while searching for job, act as a formal career prospect, provide employable skills, induce job creation, and reduce unemployment. Items on the TAPS that assess the role of parents and peers in the attitudes and perceptions towards TVET ask the respondents if they believe that parents would support their children in undertaking a TVET, whether scholarships from governmental

and non-governmental support would improve adoption of TVET, or whether having a TVET would improve perceived social status.

Content Validity

A content validity analysis was performed to assess how well the items on the instrument measured the construct “attitude or perception of youths towards TVET”. As a part of this analysis the possibility of confusing and problematic item wordings was assessed.

The items on the original draft of the instrument were assessed by individuals or members of organizations that provide technical and vocational training in Nigeria. The inclusion criteria for eligibility for assessing content validity included standard the individuals must have been actively working with youths in providing TVET services or involved in active research on youth unemployment in Nigeria for at least one year. Experts who were less than 18 years of age at the time of the study were excluded. Also, experts who were neither Nigerians nor involved with research or practice on Nigerian youths were excluded. Ethical approval was obtained from the Institutional Review Board of The University of Tennessee before the start of the study.

The content validity reviewers in this study were identified and recruited based on word-of-mouth and referrals. An electronic link to the online survey was sent to the participants. Upon consenting to participate, the questionnaire with the elements of the survey was made accessible to them. All electronic interaction from consent taking to filling out the questionnaire was done via anonymous link in Qualtrics. The study participants were aware of the estimated time required to answer all the questions and they had the choice of returning to the questions later. Completed information was collated on a designed Qualtrics template.

Analyses included frequency distributions of the item assessments. Fleiss's Kappa values, an inter-rater reliability score, were computed for inter-rater agreement on assessments of the content validity of all the items on the draft. Items that had Kappa values ranging from 0.8 to 1.0 were deemed to have strong to almost perfect agreement (McHugh, 2012). No changes were made to these items. Items that had values less than 0.8 were deemed to have moderate to minimal agreement. These items were identified for possible removal from the instrument.

Item Analysis

A pilot study was conducted to measure how well the items of the scale functioned. The study participants were Nigerian youths ages between 18 and 35 years, who were able to read and understand English. A second ethical approval was obtained from the Institutional Review Board before conducting this pilot study. The survey instrument was made available to the respondents via an anonymous Qualtrics link after the participant gave informed consent to participate in the study.

Frequency distributions of the sociodemographic characteristics of the respondents are presented in tables below. The item analysis was performed by measuring the item difficulty, item variability, item discrimination, and internal consistency estimates. The item difficulty in educational contexts is a measure of the proportion of correctly answered items. For this study, it indicated the agreeability of the respondents to the item in the scale. The item difficulty was measured using the mean item score (Office of Educational Assessment, 2020). The item variability was measured using the standard deviation of the scores of the items. The corrected item-total correlation was used to assess item discrimination (Office of Educational Assessment, 2020). The internal consistency is a measure of the reliability of the items in the scale in

measuring a latent construct (Office of Educational Assessment, 2020). For this study, the internal consistency was measured by Cronbach alpha.

Results

Original draft of measure

The original draft of the instrument had 25 items created to measure perception and attitude of youths towards TVET. The items on the original draft are shown in Table 1.

Content Validity Results

In this study a total of 25 item raters were recruited. Most of the item raters were TVET practitioners and researchers. Among item raters involved with TVET practice and program development, two-thirds had been involved with TVET for at least 5 years. About 56% had been involved with TVET research for at least 5 years while 40% of the study participants had been involved in TVET training for at least 5 years. After reviewing the items on the scale, 96% of the item raters assessed the items as adequately capturing the attitudes of persons towards TVET education in Nigeria. These results are shown in Table 2.

Validity of the Items

Of the 25 items in the survey instrument, all the raters agreed that 21 items measured attitude and perception. The remaining 4 items had an inter-rater agreement between 95% to 96%. The comments provided by raters ranged from identifying some items as measuring perception instead of attitude while some items were recommendations rather than an assessment of attitude (Table 2-3). Interrater reliability was measured using Fleiss's Kappa statistics (Sun, 2011). The Kappa statistics ranged for 0.916 to 1.0. Using the interpretation of the kappa statistics by McHugh (2012), all the ratings of items have high reliability (Table 3).

Readability and Appropriateness of the Items

Of the 25 items in the survey instrument, all the raters agreed that 16 of the items had no confusing or problematic phrasing. The agreement on the absence of confusing terms or phrases on the remaining 8 items ranged from 90 - 96%. One item had an agreement rating of 84%. The confusing terms and phrases highlighted by the instrument raters were "technical", "best strategy", "compulsory", and "acceptable backup". Since these items were accepted by the majority of raters, no changes were considered.

Item Analysis Results

Characteristics of Respondents

A total of 156 respondents participated in the pilot study. The survey completion rate was 71%. The mean (SD) age of the respondents was 26 (4.6) years (Table 4). The predominant respondents were males (42%), of the Yoruba tribe (64%), never married (60%), and having a bachelor's degree (34%). About two-thirds (63%) of the sample lived in the South-Western part of Nigeria. Approximately 35% of the sample were unemployed at the time of the survey. About 39% and 26% of the sample had neither past nor current TVET or entrepreneurship classes respectively. Details on these results are in Table 2-4.

Missing Data

Multiple imputation was used to manage the missing data on the items (Patrician, 2002). The item completion count ranged from 128 to 130 and the missing counts ranged from 25 to 32. The multiple imputation yielded 21 imputed data sets since the largest percentage of missing data was 21% for item 41 (Enders, 2017). The item analysis results were pooled across the 21 imputed data sets. Detailed missing data analysis results are shown in Table 5.

Item difficulty, variability, discrimination, and consistency

The item difficulty was fairly average, with scores ranging from 1.19 to 2.83. Similarly, the item variability was not excessive, ranging from 0.41 to 1.22. Of the 25 items, two items had an item discrimination (corrected item-total correlation) of less than 0.1. Removing these items improved the reliability of the scores on the TAPS instrument. Additionally, 4 items had a low inter-item correlation with the other items in the scale, ranging between 0.1 and 0.3. Sequential removal of two of the four improved the reliability of the TAPS while the removal of the other two did not substantially improve the reliability of the TAPS instrument.

The item consistency of the 25-item survey ranged from 0.77 to 0.80 (Table 6). After removing four items with low item discrimination values, the item consistency improved, ranging between 0.81 and 0.82 (Table 2-7). Removal of any other item did not substantially improve the reliability of scores. The mean and standard deviation of the 21-item TAPS instrument was 43.93 and 8.89 respectively. The reliability of scores on the scale, as estimated by coefficient alpha, was 0.825.

Summary: Final Draft of Measure

The final draft of measure had 21 items measuring perceptions and attitudes of youths towards TVET. Four items, from the initial 25-item list, were removed due to a combination of poor item discrimination and consistency scores. The foregoing results suggested that the 21 items have adequate content validity for measuring the attitudes and perceptions of youths towards TVET. The internal consistency results were consistent with the set of 21 items measuring a common latent construct. The items retained on the final draft are shown in Table 8.

Discussion

Summary of Results

This instrument design study presents a theoretically driven scale that can assess the attitude and perception of youths towards TVET. Using content validation and an item analysis the original 25-item scale was reduced to a 21-item measure. All the items on the scale appear to measure the perception and attitude towards TVET to varying degrees.

The reliability (Cronbach alpha) of the scores on the TAPS instrument compares favorably to other survey instruments used in TVET-related studies. Sern and colleagues (2018) reported a reliability of 0.88 on a 25-item scale that was used to measure the organizational competency of Nigerian teachers teaching TVET. Zite and Deebo (2017) reported a reliability value of 0.81 for a survey instrument administered among Nigerian teachers that measured issues, challenges, and strategies of TVET as a tool for national development.

For this study, the Fleiss' Kappa statistics, an adaptation of the Cohen's Kappa statistics for three or more raters (McHugh, 2012), was used to measure the inter-rater agreement. Other acceptable methods of measuring inter-rater agreement for content validity include the use of an item and scale content validity index (McHugh, 2012; Zamanzadeh et al., 2015). While these methods objectively quantify the relevance of items in a scale, they do not account for chance agreement (McHugh, 2012; Zamanzadeh et al., 2015). The Kappa statistics addressed this limitation by generating a result from computed observed and expected item agreement scores (McHugh, 2012). Earlier studies on TVET instrument validation have evaluated expert agreement using Kappa statistics. Olojuolawe and Amin (2019) used kappa statistics to measure expert agreement on constructs of the employable skills required by Nigerian students who studied electrical technology. Also, Said and colleagues (2018) used the Kappa statistics to

measure item agreement from expert interview data on the development of competencies elements required of polytechnic lecturers in Malaysia teaching TVET.

Using multiple imputation techniques in instrument design-related analysis is not a novel method. It is the appropriate approach (Gelman, King, & Liu, 1998), though uncommon (Enders, 2017), in handling nonresponse data in a survey. Its use becomes more prominent when the proportion of missing variable exceeds relevant subpopulation of the data which increases the risk of bias result (Sterne et al., 2009). With this study having a non-response rate of 29%, the use of multiple imputation was the most appropriate method to reduce the potential non-response bias.

Limitations

This study has limitations. All responses to the items measuring attitude and perception towards TVET were self-reported and response bias is likely. Also, the possibility exists that respondents might have given socially desirable responses. An exploratory factor analysis, which would identify the underlying constructs of the scale, was not done due to the small sample size. Despite these limitations, this study presents the first instrument that captures the perception and attitude of youths towards TVET. This instrument, therefore, is assessing what are the youth's perception and attitude towards TVET, will provide an objective rationale for a need for designing interventions that favor TVET adoption. Additionally, the items in the TAPS can identify potential factors that influence the youth's attitudes and perception towards TVET, hence providing a rationale in future research on TVET utilization. This survey instrument can also serve as an additive tool for a pre- and post-assessment to interventional TVET adoption studies, which can inform future policies on TVET in Nigeria.

Conclusion

The results suggest the TAPS is a survey tool that can measure Nigerian youths' attitude and perception towards TVET. Understanding the perception and attitude of Nigerian youths toward TVET can provide information on the reasons associated with low adoption of TVET and this information can guide the design of interventions aimed at improving TVET utilization. Increased utilization subsequently will reduce youth unemployment rates in Nigeria. However, further research concerning the validity of scores on the TAPS is needed. One form of important validity information concerns measurement equivalence of the TAPS across subpopulations in Nigeria, including measurement equivalence over the three main Tribes in Nigeria, Hausa, Igbo, and Yoruba.

CHAPTER 3

Development of Survey Instrument in Evaluating Nigerian's Youth Perception of Technical and Vocational Education and Training

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Abstract

Measuring attitudes and perception towards Technical and Vocational Education and Training (TVET) in a cross-cultural heterogeneous sample is subject to misinterpretation and bias. Assessing measurement equivalence in a survey instrument creates the opportunity to evaluate unique characteristics of respondents in a heterogeneous sample while assessing the ability of the items to measure a latent construct. This study aimed to perform a confirmatory factor analysis and measurement equivalence analysis of scores on the TVET Attitude and Perception Scale (TAPS). This cross-sectional study recruited Nigerian youths (ages 18-53 years) across all geopolitical zones in Nigeria (N=810). The survey instrument was the TAPS, a 21-item scale with good reliability (Cronbach alpha: 0.82) and where evidence of content validity has been established. Additionally, participants provided information on their age, gender, ethnicity and other demographic characteristics. A confirmatory factor analysis (CFA) was performed to verify the underlying factor structure. A Multiple Indicator, Multiple Cause (MIMIC) analysis was performed to assess measurement equivalence of the items across ethnic groups. The CFA result showed that all the 21 items in the scale loaded significantly on a single latent construct, and the model fit of the CFA was adequate (CFI: 0.91, TLI: 0.90, SRMR: 0.049, RMSEA (90% CI): 0.090 (0.088 – 0.097)). The MIMIC analysis identified differential response by gender and ethnic differences. This study provides further evidence concerning a survey instrument that can be used to assess the attitudes and perceptions of Nigerian youths towards TVET.

Introduction

Technical and Vocational Education and Training (TVET) represents a form of skill-based training that equips individuals with employable and job creation skills (Famiwole, 2015). It is an educational intervention, used in developed and developing countries to reduce unemployment and increase job opportunities (Ueno, Kimura, Neudorfer, & Maclean, 2004; M.-C. Yu, Goh, Kao, & Wu, 2017; Zirkle & Martin, 2012). In Nigeria, TVET is a recognized interventional tool capable of reducing youth unemployment in the country (Ogbunaya & Udoudo, 2015; Olajide, 2015). Despite the potentials of unemployment reduction embedded in TVET-focused programs, TVET adoption in Nigeria is low (United Nations Educational Scientific and Cultural Organization, 2019). Of the 122 universities and 83 colleges of education in Nigeria, 21 universities and ten colleges offer accredited TVET courses (Ayonmike, 2016). Also, of the 774 local government areas in Nigeria, only 110 have technical colleges (Ayonmike, 2016). The lack of government funding and public-private partnerships are recognized factors of low TVET adoption (F. A. Adebayo & Ayegbusi, 2017; Audu, Kamin, & Balash, 2013; Awogbenle & Iwuamadi, 2010). Also, individual factors such as low student enrollment in TVET accredited courses, and poor user patronage at local government technical centers are some factors associated with TVET adoption (Adegun, 2013; Ogbunaya & Udoudo, 2015). The individual factors has been theorized to be a reflection of poor attitude and perception towards TVET programs (Audu et al., 2013; Ogbunaya & Udoudo, 2015).

Attitude and perception are subjective constructs that represent an individual's opinion on, feelings about, and behavior towards a phenomenon (Pickens, 2005). With regard to TVET, an individual's attitude and perception towards vocational and entrepreneurial training is a measure of willingness to enroll in formal and informal TVET programs based on pre-formed

feelings and opinions about TVET. Conceptually, negative attitude and perception towards TVET will result in low adoption and reduced utilization of TVET, while positive attitude and perception will result in increased adoption and utilization. Attitude and perception of TVET vary widely. Earlier studies have reported negative perceptions towards TVET in developing countries like Fiji (Tagicakiverata, 2012), Thailand (Pimpa, 2007), Kenya (Simiyu, 2009), and India (Park, 2005). Contrastingly, positive attitude and perception towards TVET have been documented in European countries (TNS Opinion and Social, 2011). In Nigeria, similar varying attitude has been reported in earlier studies. A study conducted in Ogun, a state in South-West Nigeria (McKenna, Setia, & Bhutia, 2018), reported a negative attitude towards TVET enrollment (Adewale, Aderonmu, Fulani, Babalola, & Awoyera, 2018). Conversely, a study conducted in Kogi, a state in the central region of Nigeria (McKenna & Setia, 2010), reported that TVET is positively seen as a solution to unemployment in Nigeria (Hassan, 2013). An opinion paper that conceptualized the causes of unemployment among Nigerian youth, irrespective of the geographical location, identified fearful attitudes towards TVET (Adegun, 2013).

The TVET Attitude and Perception Scale (TAPS) is a survey instrument that measures the attitude and perception of Nigerian Youths towards TVET. It is an instrument that has been validated and has shown evidence of reliability (Akinsola, Nugent, Faber, Held, & Misawa, Unpublished). The instrument can be used as part of an interventional toolkit in assessing pre- and post-TVET adoption focused intervention. With the low adoption of TVET across Nigeria (KRE Okoye & Chijioke, 2013; Sabiu, Zainol, & Abdullah, 2019), and differing opinion of its role in reducing unemployment (Adewale et al., 2018; Hassan, 2013), assessing the attitude and

perception across all Nigerian youth may subject to measurement bias if the sociodemographic characteristics are not adjusted for in the design of the survey instrument.

Indeed, measuring attitude and perception in a cross-cultural sample is subject to misinterpretation and bias (Davidov, Meuleman, Cieciuch, Schmidt, & Billiet, 2014; van de Vijver & Tanzer, 1997). With Nigeria having over 250 ethnic groups with three of the ethnic groups representing sixty percent of the population (Central Intelligence Agency, 2019), assessing attitude and perception towards TVET is subject to measurement bias. Additionally, earlier studies have reported gender bias in the reduced enrollment of females in TVET programs (Caleb & Charles, 2017; Okwelle, Dighobo, & Patrick, 2018; United Nations Educational Scientific and Cultural Organization, 2019). Assessing measurement equivalence in a survey instrument creates the opportunity to evaluate unique characteristics of respondents in a heterogeneous sample while advancing knowledge of shared attributes of the respondents on the construct of interest (Davidov et al., 2014). Additionally, measurement equivalence provides the opportunity to create meaningful comparisons across sociocultural groups, which can aid the design of targeted interventions (Davidov et al., 2014; van de Vijver & Tanzer, 1997).

The TAPS is the first publicly known available survey instrument that measures the attitude and perception of Nigerian youths toward TVET. However, it is unknown to what extent the TAPS instrument responds to ethnic differences in attitude and perception towards TVET. It is hypothesized that the predictive nature of the items in the TAPS survey instrument will differ by ethnicity in a nationally representative sample population. Further strengthening the TAPS instrument to capture demographic differences among Nigerian youths will inform TVET-related policies and guide the design of TVET-related interventions. This study aims to perform a confirmatory factor analysis and measurement equivalence between the demographic

characteristics of Nigerian youths and the perception and attitude towards Technical and Vocational Education and Training (TVET) using the TAPS survey instrument.

Methods

Study Design and Location

The study used a quantitative cross-sectional survey design. Data were collected using a self-administered electronic survey after obtaining consent via acceptance to be involved. The study location was Nigeria, which is the most populous nation in the continent of Africa, with over 190 million population (Central Intelligence Agency, 2019). Nigerian youths, ages 18 -35 years, account for more than 60% of the population (Central Intelligence Agency, 2019).

Study Participants

Study participants were recruited from the six geopolitical zones in Nigeria. The researcher posted survey links on social media platforms aimed at targeting eligible youths in the six geopolitical zones in Nigeria. Participants were recruited using the following social media outlets: Facebook, WhatsApp, and LinkedIn. An anonymous Qualtrics survey link was distributed on these three social media platforms, targeted to reach users in the six geo-political (South-West, South-East, South-South, North Central, North East, and North West) zones in Nigeria. The researcher used her social media account to post the anonymous survey link. She requested her followers to disseminate the anonymous link on their social media pages. Furthermore, the anonymous Qualtrics link was shared on social media groups that have Nigerian youth followers after obtaining permission from the group administrators. The social media groups where the survey was posted on Facebook included the Nigerian Youth Sustainable Development Goals (SDG) forum, Nigerian Youth Forum, Nigerian Youth Professional forum, Nigerian Youth Leaders Forum, and Great Nigerian Youth Forum. On LinkedIn, the survey link was posted on the researcher's page. On WhatsApp, the groups the

researcher posted on include the Young African Leader Initiative (YALI) Network, and the Lagos chapter and Abuja chapter, Young Shapers Club, Ibadan, Jumpstart Dream African Alumni Group, and One African Child groups. These groups were selected because they have multi-ethnic members above 100 participants.

Inclusion and Exclusion Criteria

The study population was Nigerian youths, ages 18 to 35 years, living in any state in Nigeria. Youths who received formal education outside Nigeria were excluded from the study. Nigerian youths not residing in Nigeria at the time of the interview were excluded from the study.

Survey Instrument

The survey consisted of two segments: the TAPS scale which measures perceptions and attitudes toward TVET and a questionnaire asking about sociodemographic factors. The TAPS survey instrument consists of 21 items that assessed attitudes and perceptions towards TVET on a 5-point Likert scale. The instrument has been tested on Nigerian youths in a pilot study, and it has good reliability (Cronbach alpha: 0.82) (Akinsola, Nugent, et al., Unpublished). The sociodemographic characteristics gathered were age, sex, race, educational attainment, and employment status. Information on prior TVET training was requested.

Variables definition

The demographic characteristics of interest were age, sex, and ethnicity. Ethnicity was measured in four categories: Yoruba, Hausa, Igbo, and minority races. The dominant ethnic groups in Nigeria are Yorubas, Hausas, and Igbos (Central Intelligence Agency, 2019), while other non-dominant ethnic groups were referred to as minority groups in this study. Three dummy variables were created to represent the ethnicity variable: Hausa respondents compared

to Yoruba respondents (H-Y), and Igbo respondents compared to Yoruba respondents (I-Y), and Igbo respondents compared to Hausas (I-H)

The dependent variables for this study were the TVET Attitude and Perception Score (TAPS), and the 21 item items define the TAPS construct. The TAPS was conceptualized as a latent construct, while the 21 items of the TAPS instrument were scored on a 5-point Likert scale.

Data Analysis

Univariate Analysis

The frequencies of age categories, gender, educational attainment, ethnicity, marital status, employment status, and past or current training on TVET or entrepreneurship were computed. Also, the proportion of the agreeability of the respondents to the items in the survey were summarized in a table listing all the items in the survey.

Confirmatory Factor Analysis

A confirmatory factor analysis (CFA) was performed to assess the relationship between the items on the scale and the latent factor, TAPS. The CFA model was estimated using maximum likelihood. The goodness of fit of the model was assessed using the chi-square statistic, the comparative fit index (CFI), the Tucker Lewis Index (TLI), the Standardized Root Mean Square Residual (SRMR), and the root mean square error of approximation (RMSEA) and its 90% confidence interval. For this study, CFI and TLI values of 0.9-0.95 were adjudged to indicate an adequate fit, and values greater than 0.95 indicated a good fit (Byrne, 2010; Hu & Bentler, 1999). RMSEA values less than 0.05 indicated good fit, while values between 0.05 and 0.08 were interpreted as indicating adequate fit (Byrne, 2010; Hu & Bentler, 1999). Also, the

90% confidence interval for RMSEA less than 0.08, and a p-value greater than 0.05, were adjudged to indicate an adequate fit, while lower bounds of the confidence interval of 0.05 or lower represented a good fit (Byrne, 2010; Hu & Bentler, 1999).

Multiple Indicator, Multiple Cause Analysis

A Multiple Indicator, Multiple Cause (MIMIC) model was used to assess the effect of age, sex, and dummy ethnicity variables (H-Y and I-Y) on the TAPS model derived from the confirmatory factor analysis. This MIMIC model was a test of measurement equivalence. The baseline model included paths from the demographic characteristics to the latent variable, TAPS, and from the latent TAPS construct to the 21-item survey elements. The modification indices from results of the model were used to identify possible sources of lack of measurement equivalence.

For this study, CFI and TLI with values greater than 0.90 were adjudged to be adequate, while values exceeding 0.95 were interpreted as indicative of good fit (Byrne, 2010; Hu & Bentler, 1999). Additionally, RMSEA and SRMR values of less than 0.08 represented adequate fit, and values of 0.05 and lower, represented good fit (Byrne, 2010; Hu & Bentler, 1999). All statistical analysis was performed using Mplus, version 8.4 (Muthén & Muthén, 2017).

Results

Univariate Analysis

A total of 810 respondents consented to be part of the electronic survey, 610 participants responded to all the items on the TAPS instrument, and 584 of the 610 respondents provided additional information about their age, sex, and race. The survey completion rate was 72.10%.

The sample had a fairly even gender distribution of males (52%) and females (48%) (Table 3-1). About 61% of the sample were within the age group of 20 - 29 years. Yorubas were

the most represented ethnic group (47%), while the proportions of the Hausas and Igbos were 18% and 22%, respectively. Most of the sample were never married (86%), were unemployed (59%), and with only a secondary school certificate (41%). About 40% of the sample had never had either a TVET or entrepreneurship training before.

A large proportion of the respondents agreed and strongly agreed that TVET is needed in secondary schools (94%), universities (91%), and polytechnics (92%) and that TVET should be made compulsory from secondary schools (87%) (Table 3-2). Similarly, a large proportion of the respondents agreed and strongly agreed that sponsorship will enhance youth participation in TVET (91%), that lack of adequate financing is a barrier (86%), and that scholarship will enhance youth participation in TVET (88%). Over 70% of the respondents agreed and strongly agreed that most parents (74%) and guardians (75%) would be willing to send their children to TVET programs. Additionally, over 70% of the respondents agreed and strongly agreed that TVET should be equivalent to getting a university degree (77%), have the same high standing as other professional courses (71%), and should be a highly regarded career path in Nigeria (78%). Furthermore, a large proportion of the respondents agreed and strongly agreed that TVET will provide youths with employable skills (90%), enhance job creation (92%), and that taking the TVET courses are the best strategies to starting businesses after graduation (89%). A substantial proportion of the sample population agreed and strongly agreed that enrolling in TVET programs makes them equal to their peers in the universities (69%) and that the TVET courses will improve their social status among peers (85%). About 92% of the respondents agreed and strongly agreed that TVET can reduce unemployment in Nigeria, and 90% of the respondents agreed and strongly agreed that they will like to enroll in a TVET program.

Confirmatory Factor Analysis

All the 21 items on the scale loaded statistically significantly on the latent construct, with all factor loadings greater than 1.0. The overall model Chi-square was, $\chi^2 = 1644.9$; p-value <0.001 (Table 3-3). The baseline model had fit indices below adequate fit (CFI: 0.88, TLI: 0.87, SRMR: 0.052, RMSEA (90% CI): 0.108 (0.103 – 0.113)). Modification indices suggesting correlating the residual variances between items Q7 and Q10, Q16 and Q17, Q18 and Q19. This made theoretical sense given the common wordings between these items (Brown, 2015). These changes significantly improved the model, producing a statistically significant chi-square change of 400.6 (p-value <0.001). The post-modification model fit was adequate. The CFI and TLI post-modification were 0.91 and 0.90, respectively. Also, the SRMR and RMSEA (90% CI) post-modification were 0.049 and 0.090 (0.088 – 0.097).

The intercept estimates for each variable ranged from 1.19 to 1.72. The latent construct predicted between 48% and 68% of the variance in the item scores, and the residual variances in the item scores ranged from 27% to 82% across the items.

Measurement Equivalence Analysis

A MIMIC model assessed the measurement equivalence of the scores on the TAPS by demographic differences, age, and gender. Results are shown in Figure 3-1. There were no differences in the responses to the survey items by age. Igbo respondents, as compared to Yorubas, responded significantly differently on item Q2, Hausas as compared to Yorubas responded significantly differently on Q2, and Igbos as compared to Hausas, responded significantly differently to Q2. Additionally, females, as compared to males, responded significantly differently to item Q7.

The MIMIC model was a fairly adequately fitting model, CFI: 0.91, TLI: 0.90, SRMR: 0.046, RMSEA (90% CI): 0.080 (0.076 – 0.084), (see Table 3-5). The paths indicating the lack of measurement equivalence (Igbo compared to Yoruba on Q2, Igbos compared to Hausas on Q2, Hausas compared to Yorubas n Q2, and females compared to males on Q7) produced a significant chi-square change in the model showing some lack of measurement equivalence ($\chi^2 = 27.5$; p-value <0.001). The MIMIC model suggesting lack of measurement equivalence for these items produced a mild improvement in the model fit, CFI: 0.91, TLI: 0.90, SRMR: 0.045, RMSEA (90% CI): 0.079 (0.075 – 0.084).

Discussion and Implications

Discussion

In this study, the results suggested the TAPS items were significantly associated with the latent construct. The MIMIC model, which appeared to adequately fit the data, suggested differential item functioning by gender and ethnicity on the two items identified. Gender-response differences were demonstrated on items that assessed parents' willingness to enroll children in TVET programs, and ethnic-response differences were demonstrated on the item that measured the need for TVET in universities.

In this study, a significant proportion of females did not agree that parents are willing to enroll children in TVET. This perception of parental influence on TVET enrollment might be a reflection of gender bias in TVET enrollment that has been reported in earlier studies. As of 2019, less than 40 percent of females enrolled in TVET programs (United Nations Educational Scientific and Cultural Organization, 2019). Previous studies have attributed the gender bias to a cultural norm, parental preference of educating the male child as compared to the female child, and societal belief in early marriage for the girl child (Okwelle et al., 2018).

In this study, a significant proportion of Igbos, as compared to Yorubas and Hausas, agreed that TVET is not needed in the universities. This observed cultural difference may be a reflection of the disproportional distribution of formal TVET institutions in Nigeria. TVET is majorly offered in polytechnics in Nigeria (United Nations Educational Scientific and Cultural Organization, 2019), although a few universities offer accredited TVET courses to a varying extent (Ugwoke, Ezeji, Edeh, & Etonyeaku, 2016). Compared to the northern part of the country where most of the Hausas and Fulanis reside, and the southwest where the Yorubas reside (Central Intelligence Agency, 2019), the southeastern part of Nigeria with a dominant Igbo population (Central Intelligence Agency, 2019) have fewer formal TVET-accredited institutions. Of the 29 accredited federal TVET polytechnics in Nigeria, twelve institutions are located in the North, six in the South-West, and two in the South-East (National Board for Technical Education, 2020b). Also, of the 48 accredited state-owned polytechnics in Nigeria, 16 are in the North, 15 in the South-West, and five in the South-East (National Board for Technical Education, 2020a). While there exists a disparity in the distribution of TVET institutions in Nigeria, the observed measurement inequivalence among Igbos compared to the other two ethnic populations may also be a reflection of coverage error as less Igbos responded to the survey compared to the other two ethnic populations.

In the final model, the residual variances of items that assessed parents (Q7) and guardians (Q10) willingness to enroll their children or wards in TVET were correlated. While this modification was suggested by statistical inferences to improve the fit of the model, a conceptual relationship between the two items exists. The two items share similar wording and content regarding enrollment in TVET. This modification resonates with earlier studies on TVET

in Nigeria, in which parental and guardian roles in TVET are not differentiated. Dike et al. (2013), while describing the Nigerian TVET experience, used the terms parents and guardians interchangeably. Chukkas –Onaeko (2014), in identifying the stakeholders of TVET, categorized parents and guardians as a single unit. Ajose and colleagues (2015), in discussing areas where TVET interventions should be addressed, identified parents and guardians as a single factor. Additionally, the shared wording and construct apply to the items that assess whether TVET should have the same standard as going to the university (Q16), TVET should be equivalent to getting a degree from the university (Q18), and enrolling in TVET should make one equal to peers that enroll in universities (Q19). It was, therefore, conceptually reasonable to correlate the residual item variances as guided by the modification indices.

Limitations and strengths

This study has its limitations. The possibility of a coverage error might exist as the study disproportionately recruited more Yoruba respondents compared to other tribes. Also, non-response bias is likely as the proportion of missing variables formed about a quarter of the entire sample. A multiple group CFA to test measurement equivalence could not be done due to the relatively small sample size. Although the relatively small sample size restricted the analysis to a CFA and MIMIC model, the sample size represents one of the largest pool of respondents among other quantitative TVET studies focused on reducing youth unemployment in Nigeria (Akinsola, Held, et al., Unpublished; Akpan & Etor, 2013; Hassan, 2013; Olajide, 2015).

Implications

Despite these limitations, the TAPS instrument represents one of the few survey instruments on TVET that focuses on students in need of employment rather than the TVET stakeholders. It is also the only publicly known survey instrument that has validity evidence to

assess attitudes and perceptions of TVET among Nigerian youth. If the items showing lack of measurement equivalence are deleted, the current results would suggest the TAPS measure would show measurement equivalence across the variables included in the MIMIC analysis. This would suggest the tool can be effective in measuring the latent construct across gender, relevant age groups, and ethnicity. This evidence, while somewhat restricted due to the above limitations, would suggest the TAPS can be used by researchers in Nigeria interested in TVET and youths.

Though the model fit of the foregoing analyses was adequate, future studies should further investigate this instrument if the goal is to use this tool as part of a targeted TVET-focused intervention for a minority youth population in Nigeria. Additionally, the adaptability of this tool as a national survey instrument presents an area of future study which should include producing and validating the instrument in the Yoruba, Igbo and Hausa languages, obtaining a representative proportional sample from the three ethnic population, and oversampling the minority ethnic population.

Conclusion

This study offers researchers in Nigeria with a measurement tool, assuming the items showing lack of measurement equivalence are removed, that can be used to assess the attitudes and perceptions of Nigerian youths towards TVET. The items in the TAPS survey collectively and significantly measure a single latent construct. Nineteen of the 21 items do not show lack of measurement equivalence by gender or ethnicity. The TAPS survey instrument can, therefore, serve as a tool that can capture baseline attitudes and perception about TVET. Additionally, this

survey instrument can be used as an assessment tool pre- and post TVET adoption-focused interventions at national, regional, and local government levels.

Conclusion and Recommendation

Reducing youth unemployment requires a multi-level approach which involves individual, family, societal, organizational, and governmental level approach. This dissertation reviewed existing literature on the proposed educational interventions as the unemployment rate has not shown any sign of reduction. With the educational institutions having a role in producing graduates in the workforce, TVET was conceptualized as a potential and achievable intervention for youth unemployment. The lack of publicly available instruments to measure the attitudes and perceptions towards TVET made an objective assessment impossible. This dissertation has provided a tool that appears to objectively measure attitudes and perceptions towards TVET. This is an important step towards being able to assess TVET interventions in Nigeria.

The development of a survey instrument is, indeed, a useful starting point to several future quantitative and qualitative studies on TVET adoption among youths, which is lacking. Findings in this dissertation suggest it is feasible to use this survey instrument to measure Nigerian youth's attitudes and perceptions towards TVET. The emphasis for future research should focus on obtaining a nationally representative sample and possibly oversampling the minority populations. With the official language in Nigeria being English, a need for survey item translation might not be an immediate necessity. However, Nigerian educational institutions may benefit from the instrument translation for future studies.

Additionally, future research can explore the underlying sub-constructs underlying the 21-items on the TAPS survey instrument. Such studies can build further knowledge about the existing instrument while addressing some of the limitations of this dissertation. The factor

structures that emerge from future exploratory analyses can guide an assessment of the factors associated with youth's attitudes and perceptions towards TVET.

The goal of assessing the attitudes and perceptions towards TVET is ultimately to use such data to assess interventions for implementing TVET and achieve a reduction in youth unemployment rates in the country. Following the availability of a TVET adoption-focused survey instrument that has been validated, an appropriate next step is to design interventions targeted at Nigerian youth attitude and perception of TVET. Assessing pre- and post-interventional attitudes and perceptions towards TVET with the TAPS instrument will provide an objective framework for assessing the impact of such interventions. The implications of such studies will inform policies and practices toward TVET.

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APPENDIX

Table 1-1: Characteristics of Quantitative Studies of Educational Interventions

Authors (Year)	Study Design	Study Population (Region)	Sample Type	Predictor Variables	Study Outcomes
Akpan and Etor (2013)	Survey	University lecturers and instructors (South-South)	480	The relevance of Entrepreneurship Education Entrepreneurial Skill	Job Creation
Hassan (2013)	Survey	Undergraduates students (South-West)	220	Perception of Entrepreneurial Development Entrepreneurship	Unemployment Employment opportunity generation
Olajide (2015)	Survey	Polytechnic students (South-West)	78	Technical and Vocational Education and Training	Unemployment.

Table 1-2: Summary of the theoretical studies identifying factors contributing to youth unemployment and the proposed solutions.

Authors (Year)	Concept Definitions	Factors Contributing to Youth Unemployment	Propositions
Abimbola, Donatus, and Olowu (2016)	Entrepreneurship is being able to identify opportunities to bring about business creation.	1. Inadequate education 2. Lack of appropriate training 3. Exceedingly high occupational and wage aspirations 4. Lack of work experience and inappropriate attitudes	1. Encourage entrepreneurship through the provision of finance.
F. A. Adebayo and Ayegbusi (2017)	PPP is the agreement or contract between the private sector and the public sector (government) to work together in creating opportunities through the combinations of resources.	1. Faulty education system 2. Negligence of agriculture practices 3. Low level of human capital development 4. Poor governance 5. High corruption 6. Lack of financial support 7. Lack of investment in informal sectors	1. Investment in public-private partnership (PPP) between government and private companies to gear up job creation. 2. Encourage entrepreneurship endeavors through the provision of financial resources and training opportunities.
Adegun (2013)	Entrepreneurship is setting up a business through the identification of opportunities within the economy.	1. Lack of funding 2. Lack of opportunities in the labor market 3. Social/cultural attitudes of youth	1. Entrepreneurship education should be incorporated into the school systems as early as primary school level. 2. It should be made compulsory at all school levels. 3. The higher institution should cultivate a relationship with businesses to help their students experience hands-on training to learn. 3. State-wide innovation funds to encourage and support entrepreneurship should be made available for youth to access.

Table 1-2 continued

Aja-Okorie and Adali (2013)	Entrepreneurship education equips students with the knowledge, skills, and experience to launch a business.	<ol style="list-style-type: none"> 1. Lack of development of small-scale sectors 2. Focus on white-collar jobs at the detriment of other types of jobs 	<ol style="list-style-type: none"> 1. Entrepreneurship education should be made available at all level of schooling, i.e. from primary school to university. 2. Entrepreneurship education should be made compulsory in all secondary schools across Nigeria. 3. Entrepreneurship education teachers and instructors should be retrained regularly.
Ajufo (2013)	Career guidance is the combination of education guidance with vocational guidance to provide students with well-informed information about the labor market.	<ol style="list-style-type: none"> 1. Population growth without increase economic growth 2. Geographical mobility from rural to urban settings 3. Lack of employable skills 4. Inappropriate school curriculum 5. Poor governance 	<ol style="list-style-type: none"> 1. Effective career guidance is needed to guide students in pursuing a career path that aligns with their talents and available jobs in the labor market. 2. Career guidance counseling should be made compulsory for all students at all education levels. 3. Entrepreneurship education should be incorporated into secondary and tertiary curriculums. 4. TVET should be integrated at all educational level 5. School-to-work should be created and encourage students to acquire jobs before finishing their secondary or tertiary education.

Table 1-2 continued

Audu et al. (2013)	TVET is the education that equips youth with the needed skill sets to work in industries specific areas.	<ol style="list-style-type: none"> 1. Lack of job creation 2. Lack of funding for self-employment 3. Lack of employable skillsets 4. Lack of technical and vocational education (TVE) 5. Increase in a population with dwindling industrial growth 6. The public negative attitude towards TVE. 	<ol style="list-style-type: none"> 1. Re-imaging of technical and vocational education (TVE) to counteract the negative perception of TVE among youth and parents. 2. Provision of soft loans or credits for students and youth interested in self-employment. 3. Reinvestment in TVE to have adequate funding, teaching materials, equipment, and teachers to produce better results and enable a reduction in youth unemployment.
Awogbenle and Iwuamadi (2010)	Entrepreneurship is the launching of businesses to boost the economy.	<ol style="list-style-type: none"> 1. Political instability 2. Lack of investment in skill acquisition training and vocational education 	<ol style="list-style-type: none"> 1. Funding should be provided to youth to encourage entrepreneurship. 2. Entrepreneurship development centers are set up to train educated and uneducated youth about business creation.
Maigida et al. (2013)	<ol style="list-style-type: none"> 1. Entrepreneurship is the review of opportunities and gathering the resources needed to create a business. 2. TVET is the education that prepares individuals for work. 	<ol style="list-style-type: none"> 1. Lack of technical vocational education and training 2. Corruption 3. Lack of economic growth and development 	<ol style="list-style-type: none"> 1. Incorporation of TVET into school curriculums to develop youth into job creators. 2. Provision of adequate financing for vocational/technical training. 3. Encourage out-of-school young people to be involved in vocational training to promote social inclusion as well as enhance employability. 4. Entrepreneurship skills should be incorporated into all school curricula.

Table 1-2 continued

Maina (2014)	Entrepreneurship is an individual or a group identify opportunities and utilize resources available to produce economic goods, products or services.	<ol style="list-style-type: none"> 1. Lack of entrepreneurship education 2. More graduates than employment opportunities 3. Political instability 	<ol style="list-style-type: none"> 1. Incorporate entrepreneurship education into universities across Nigeria. 2. Provide funding for young people interested in being entrepreneurs.
Nkechi, Emeh Ikechukwu, and Okechukwu (2012)	<ol style="list-style-type: none"> 1. Unemployment: number of individuals who are actively seeking job opportunities but cannot find work. 2. Entrepreneurship: is beyond just starting a business but revolve around identifying a need or an opportunity and using various resources and skills to meet the needs in an economically productive way. 	<ol style="list-style-type: none"> 1. Political instability 2. High rural-urban migration 3. Rapid population growth 4. Outdated school curriculums 5. Overreliance on importing 	<ol style="list-style-type: none"> 1. Make entrepreneurship available across all Universities in Nigeria. 3. Funding to encourage youth to pursue entrepreneurship
Ogbunaya and Udoudo (2015)	TVET is a variety of experiential learning that prepares people for the world of work.	<ol style="list-style-type: none"> 1. Very poor perception of technical and vocational education and training 2. Lack of economic development 	<ol style="list-style-type: none"> 1. creation of opportunities for internship and apprenticeship 2. Nigeria government should learn from other countries like China, Korea, Ghana, Indonesia, and Germany with a robust technical and vocational system that has led to an increase in job opportunities. 3. Funding provision to assist youth in starting up.

Table 1-2 continued

Ogbuanya and Ofonmbuk (2015)	TVET defined as learning that instills in students the skill sets needed to operate in specific industries as well as preparing them for employment opportunities.	<ol style="list-style-type: none"> 1. Skill mismatch 2. Lack of relevant skillsets 3. Rapid rural-urban migration 4. The decline in the manufacturing sector 5. Inappropriate school curriculum 6. Rapid population growth 	<ol style="list-style-type: none"> 1. Incorporation of TVET into tertiary institutions in Nigeria. 2. Investment in TVET teacher training and provision of capital for materials and equipment. 3. Creation of apprentice programs through a public-private partnership to foster school-to-work transition.
Ojeifo (2013)	Entrepreneurship is the ability to start a business and transform ideas into goods and products.	<ol style="list-style-type: none"> 1. Political instability 	<ol style="list-style-type: none"> 1. Introduce entrepreneurship education into secondary and tertiary institutions in Nigeria. 2. Access to capital and mentoring opportunities for budding entrepreneurs.
KR Okoye and Udoudo (2015)	Vocationization of education is the inclusion of vocation and technical into the current school curriculum to bring about an increased opportunity for formal and informal employment opportunities.	<ol style="list-style-type: none"> 1. Inadequate preparation of youths by the educational system for the labor market 2. Lack of employable skills 	<ol style="list-style-type: none"> 1. Entrepreneurship education should be incorporated into all levels of education in Nigeria. 2. Create entrepreneurship centers where youth and graduates can learn and train in various types of self-employment paths. 3. Provision of start-up capital to aid youth interested in entrepreneurship.
Onuma (2016)	Entrepreneurship is the process of bringing different components that are needed to start and run a business, such as money, resources, and creative thinking, to seek opportunities that boost the economy.	<ol style="list-style-type: none"> 1. Irrelevant curriculum 2. Lack of entrepreneurship education 	<ol style="list-style-type: none"> 1. Redesign of senior secondary school and tertiary institution curricula to incorporate vocational subjects. 2. The curricula of senior secondary and tertiary education are revised to integrate entrepreneurship education.

Table 1-2 continued

Onuma (2016) (Continued)			3. Entrepreneurship education and vocational subjects should be made compulsory to all students as early as the secondary school. 4. Funding should be provided and made available for students to put into practice what is learnt.
Oviawe (2010)	Entrepreneurship is the willingness to look for funding opportunities to start a business.	1. Conflicts 2. Lack of employable skills 3. Low labor market demands for labor.	1. Teach creativity and entrepreneurship education at an early age. 2. Curriculum integration of entrepreneurship and community development. 3. Finance to help young people begin the journey of self-employment.
(CGE Salami, 2011a)	Entrepreneurship is the ability to start a new business or pursue opportunities.	1. Disequilibrium between labor market demands 2. Lack of essential skills 3. Over-dependence on a single natural resource (oil)	1. Need for a change in the perception of technical and vocational education. 2. Incorporate entrepreneurship education into school curriculums. 3. Provision of financial capital and support for intending youth who are going into self-employment.
CGE Salami, (2011b)	Entrepreneurship is the creation of a new business.	1. Lack of essential skills needed in the labor market 2. High population growth 3. Rural underdevelopment leading to urban migration	1. Investment in technical and vocational education. 2. Update of the curriculum of learning starting at the secondary school level to focus more on economic trends.

Table 1-2 continued

CGE Salami, (2011b) Continued			<ul style="list-style-type: none"> 3. Increase access to education through the provision of assistance for youth. 4. A private-public partnership needs to be a priority to enhance the fast growth and development of the technical and vocational field.
CGE Salami (2013)	Entrepreneurship defined as either starting a business or innovating an already established company.	<ul style="list-style-type: none"> 1. Poorly coordinated intervention programs 2. Government corruption and political instability 3. Lack of employable skills 	<ul style="list-style-type: none"> 1. High emphasis on entrepreneurship education in all levels of education in Nigeria. 2. The government should develop entrepreneurship programs that provide access to funding, mentoring, and support for new entrepreneurs.
Uddin (2013)	Unemployment defined as people willing to work, seeking work but are without it.	<ul style="list-style-type: none"> 1. Instability 2. Lack of enabling environments 3. Lack of employment opportunities informal sectors. 	<ul style="list-style-type: none"> 1. Skill development and training are of paramount importance. 2. Investment in a practical form of education. 3. Creation of a better labor market.

Table 1-3: Summary of the quantitative studies identifying recommendations for reducing youth unemployment in Nigeria

Authors (Year)	Moderating variables	Summary of findings	Recommendations
Akpan (2013)	None	Entrepreneurship education is relevant in ensuring students become self-employed after graduation. The top five entrepreneurial skills chosen as necessary for job creation were: informational skills, financial management skills, risk-taking skills, communication skills, and motivational skills.	Include entrepreneurship learning into school curriculums in Nigeria. Entrepreneurial skills acquisition should be of high priority for students.
Hassan (2013)	None	Participants believe youth unemployment can be solved through entrepreneurial development. Entrepreneurship can lead to job creation.	Entrepreneurial programs and curriculums should be imbibed into all university education. Funding should be provided by both private and public entities to assist students in starting up their businesses after taking entrepreneurship courses.
Olajide (2015)	None	Participants believe that TVET can resolve the issue of youth unemployment in Nigeria.	TVET should be integrated into the education system. There should be the training for more staff for TVET.

Table 1-4a: Summary of the quality assessment of the quantitative and theoretical selected in the systematic review

S/ N	Criteria	Akpan et al (2013)*	Hassan (2013)*	Olajide (2015)*	Abimbola et al.(2016)	Adebayo et. al(2013)	Adegun et. Al (2013)	Aja-korie et al (2013)	Ajufo (2013)
1	Research question(s)/Objective(s) sufficiently described?	2	2	0	0	0	1	1	0
2	Study design evident and appropriate?	2	2	0	-	-	-	-	-
3	Method of subject/input variables described and appropriated?	1	1	0	-	-	-	-	-
4	Does the paper address a focused issue?	2	2	2	2	2	2	2	1
5	Was an explicit account of the theoretical/conceptual framework given	0	2	0	0	1	2	1	0
6	Is there a clear description of the context?	2	2	2	2	2	1	2	2
7	How was the sample chosen, is it adequate?	1	2	1	-	-	-	-	-
8	Was there a clear description of data collection methods, were they appropriate?	2	2	1	-	-	-	-	-
9	Was there a clear description of data analysis methods, were they appropriate?	2	2	1	-	-	-	-	-

Table 1-4a continued

10	Does the research provide an audit trail from the raw data (numbers, quotations or examples), to an analysis and interpretation of the meaning and significance of it?	1	2	1	-	-	-	-	-
11	Are the findings/proposed ideas relevant to policy/practice, do they provide guidance for future research?	2	2	2	2	2	2	2	2
Total Score		17	21	10	6	7	8	8	5

*quantitative papers

Table 1-4b: Summary of the quality assessment of the theoretical papers selected in the systematic review

S/ N	Criteria	Audu et al(2013)	Awogbenle (2010)	Maigida (2013)	Maina (2014)	Nkechi et al (2012)	Ogbuany a (2015a)	Ogbuany a (2015b)	Ojeifo (2013)
1	Research question(s)/Objective(s) sufficiently described?	0	0	0	0	2	0	0	1
2	Study design evident and appropriate?	-	-	-	-	-	-	-	-
3	Method of subject/input variables described and appropriated?	-	-	-	-	-	-	-	-
4	Does the paper address a focused issue?	2	2	2	2	2	2	1	2
5	Was an explicit account of the theoretical/conceptual framework given	0	0	0	0	2	0	0	0
6	Is there a clear description of the context?	2	2	2	2	2	1	2	1
7	How was the sample chosen, is it adequate?	-	-	-	-	-	-	-	-
8	Was there a clear description of data collection methods, were they appropriate?	-	-	-	-	-	-	-	-
9	Was there a clear description of data analysis methods, were they appropriate?	-	-	-	-	-	-	-	-
10	Does the research provide an audit trail from the raw data (numbers, quotations or examples), to an analysis and interpretation of the meaning and significance of it?	-	-	-	-	-	-	-	-

Table 1-4b continued

11	Are the findings/proposed ideas relevant to policy/practice, do they provide guidance for future research?	2	2	2	2	2	2	2	2
	Total Score	6	6	6	6	10	5	5	6

Table 1-4c: Summary of the quality assessment of the theoretical papers selected in the systematic review

S/N	Criteria	Okoye (2015)	Onuma (2016)	Oviawe (2010)	Salami (2011a)	Salami (2011b)	Salami (2013)	Uddin (2013)
1	Research question(s)/Objective(s) sufficiently described?	2	0	0	2	2	2	0
2	Study design evident and appropriate?	-	-	-	-	-	-	-
3	Method of subject/input variables described and appropriated?	-	-	-	-	-	-	-
4	Does the paper address a focused issue?	2	2	2	2	2	2	2
5	Was an explicit account of the theoretical/conceptual framework given	0	0	0	0	-	-	-
6	Is there a clear description of the context?	2	1	2	1	1	1	1
7	How was the sample chosen, is it adequate?	-	-	-	-	-	-	-
8	Was there a clear description of data collection methods, were they appropriate?	-	-	-	-	-	-	-
9	Was there a clear description of data analysis methods, were they appropriate?	-	-	-	-	-	-	-
10	Does the research provide an audit trail from the raw data (numbers, quotations or examples), to an analysis and interpretation of the meaning and significance of it?	-	-	-	-	-	-	-
11	Are the findings/proposed ideas relevant to policy/practice, do they provide guidance for future research?	2	2	2	2	2	2	2
Total Score		8	5	6	7	7	7	5

Table 2-1: Original draft of the TVET Attitude and Perception Survey (TAPS) instrument

S/N	Items	SA	A	U	D	SD
1	Technical and vocational education and training (TVET) courses are needed in secondary schools.					
2	Technical and vocational education and training (TVET) courses are needed in the universities.					
3	Technical and vocational education and training (TVET) courses are for any interested students					
4	Technical and vocational education and training (TVET) courses should be available for students desiring a university degree.					
5	Technical and vocational education and training (TVET) courses should be available for students from any type of family.					
6	Technical and vocational education and training (TVET) courses should be available for students from all income levels in Nigeria.					
7	Technical and vocational education and training (TVET) courses should be made available in polytechnics.					
8	Sponsorship opportunities would enhance youth participation in technical and vocational education and training (TVET).					
9	Enrolling in technical and vocational education and training (TVET) courses will improve my social status among peers.					
10	Technical and vocational education and training (TVET) courses are the best strategies lead students into starting their own businesses after graduation.					
11	Most parents would be willing to send their children to technical and vocational education and training (TVET) programs.					
12	Technical and vocational education and training (TVET) is an acceptable back-up plan if I fail to get my dream job after my formal (professional) training.					
13	Technical and vocational education and training (TVET) is highly regarded as an important career path in Nigeria.					

Table 2-1 continued

14	Most guardians would be willing to send their wards to technical and vocational education and training (TVET) programs.
15	There are long term career prospects for youth who choose technical and vocational education and training (TVET) programs.
16	Lack of adequate financing of technical and vocational education and training (TVET) is a barrier to employment for youth.
17	Provision of scholarship would enhance youth participation in technical and vocational education and training (TVET).
18	Technical and vocational education and training (TVET) provide youth with employable skills.
19	Technical and vocational education and training (TVET) will enhance job creation among youth in Nigeria.
20	Technical and vocational education and training (TVET) programs should be equivalent to getting a degree from a university.
21	Technical and vocational education and training (TVET) should be made compulsory starting from secondary school education level in Nigeria.
22	Technical and vocational education and training (TVET) has the same high standing as going to university for professional degrees.
23	Enrolling in technical and vocational education and training (TVET) programs as a career path makes me equal to peers who are enrolled in a university.
24	I would like to enroll in a technical and vocational education and training (TVET) program.
25	Technical and vocational education and training (TVET) can reduce youth unemployment in Nigeria

Table 2-2: Characteristics of the instrument experts that performed the content validation of the survey instrument and opinion on the adequacy of the TAPS instrument.

Variable	Frequency (%)
Status of Respondents	
TVET Practitioner	11 (44.0)
TVET Researcher	9 (36.0)
TVET Trainer	5 (20.0)
Number of years involved with TVET practice and program coordination	
1-5 years	3 (33.3)
5 years +	6 (66.7)
Number of years involved with TVET research	
1-5 years	4 (44.4)
5 years +	5 (55.6)
Number of years involved with TVET training	
1-5 years	3(60.0)
5 years +	2 (40.0)
Does your assessment lead you to conclude the set of items adequately represents the complexity of the concept of “persons’ attitudes towards TVET education in Nigeria?”	
Yes	24 (96.0)
No	1 (4.0)
Reason for suggesting that new items should be created	An item measures “perception”

TAPS: TVET Attitude and Practice Survey

Table 2-3: Results of content validity showing the percentage agreement of how the survey items measures attitude and practice towards TVET and the inter-rater agreement (N=25)

S/N	Item	Yes (%)	No (%)	Feedback	Kappa
1.	Technical and vocational education and training (TVET) courses are needed in secondary schools.	25 (100.0)	0 (0)	-	1
2.	Technical and vocational education and training (TVET) courses are needed in the universities	25 (100.0)	0 (0)	-	1
3.	Technical and vocational education and training (TVET) courses should be available for any interested students	25 (100.0)	0 (0)	-	1
4.	Technical and vocational education and training (TVET) courses should be available for students desiring a university degree	25 (100.0)	0 (0)	-	1
5.	Technical and vocational education and training (TVET) courses should be available for students from any type of family	25 (100.0)	0 (0)	-	1
6.	Technical and vocational education and training (TVET) courses should be available for students from all income levels in Nigeria	24 (96.0)	1 (4.0)	It measures perception	0.92
7.	Technical and vocational education and training (TVET) courses should be made available in polytechnics	25 (100.0)	0 (0)		1
8.	Sponsorship opportunities would enhance youth participation in technical and vocational education and training (TVET).	24 (96.0)	1 (4.0)	Recommendation not attitude	0.92
9.	Enrolling in technical and vocational education and training (TVET) courses will improve my social status among peers	25 (100.0)	0(0)		1
10.	Technical and vocational education and training (TVET) courses are the best strategies to lead students into starting their businesses after graduation	24 (100.0)	0 (0)	-	1

Table 2-3 continued

11.	Most parents would be willing to send their children to technical and vocational education and training (TVET) programs	25 (100.0)	0 (0)	-	1
12.	Technical and vocational education and training (TVET) is an acceptable back-up plan if I fail to get my dream job after my formal (professional) training	25 (100.0)	0 (0)	-	1
13.	Technical and vocational education and training (TVET) is highly regarded as an important career path in Nigeria	25 (100.0)	0(0)	-	1
14.	Most guardians would be willing to send their wards to technical and vocational education and training (TVET) programs.	25 (100.0)	0(0)		1
15.	There are long term career prospects for youth who choose technical and vocational education and training (TVET) programs	25 (100.0)	0(0)		1
16.	Lack of adequate financing of technical and vocational education and training (TVET) is a barrier to employment for youth	25 (100.0)	0 (0)	-	1
17.	Provision of scholarship would enhance youth participation in technical and vocational education and training (TVET)	25 (100.0)	0 (0)	-	1
18.	Technical and vocational education and training (TVET) provides youth with employable skills	24 (100.0)	0 (0)	-	1
19.	Technical and vocational education and training (TVET) will enhance job creation among youth in Nigeria	25 (100.0)	0 (0)	-	1
20.	Technical and vocational education and training (TVET) programs should be equivalent to getting a degree from a university	24 (100.0)	0 (0)	-	1
21.	Technical and vocational education and training (TVET) should be made compulsory starting from secondary school education level in Nigeria	25 (100.0)	0 (0)	-	1

Table 2-3 continued

22.	Technical and vocational education and training (TVET) has the same high standing as going to university for professional degrees	23 (95.8)	1 (4.2)	No comment	0.92
23.	Enrolling in technical and vocational education and training (TVET) programs as a career path makes me equal to peers who are enrolled in a university	24 (96.0)	1 (4.0)	A perception	0.92
24.	I would like to enroll in a technical and vocational education and training (TVET) program	25 (100.0)	0 (0)		1
25.	Technical and vocational education and training (TVET) can reduce youth unemployment in Nigeria.	25 (100.0)	0 (0)		1

Table 2-4: Demographic and employment characteristics of the sample population in the pilot study (N=156)

Variable (N=156)	Frequency	Percentage
Age (in years)		
Mean (SD)	26.48 (4.60)	
Gender		
Male	66	42.3
Female	53	34.0
Unknown	37	23.7
Educational Status		
Secondary School	14	9.0
Diploma and Polytechnic	10	6.4
Bachelor's Degree	53	34.0
Masters' Degree	34	21.8
Doctoral and Professional Degree	8	5.1
Unknown	37	23.7
Marital Status		
Married	26	16.7
Divorced	1	0.6
Never Married	93	59.6
Unknown	36	23.1
Ethnicity		
Yoruba	100	64.1
Ijaw/Efik/Ibibio	8	5.1
Ibo	10	6.4
Hausa and Fulani	1	0.6
Unknown	37	23.7
Region of Residence		
South-West Nigeria	98	62.8
South-South Nigeria	9	5.8
South-East Nigeria	2	1.3
Northern Nigeria	3	1.9
Unknown	44	28.2
Employment Status		
Employed	64	41.0
Not Employed	55	35.3
Unknown	37	23.7

Table 2-4 continued

Past or current TVET		
Yes, in the past	49	31.4
Yes, currently	10	6.4
No	60	38.5
Unknown	37	23.7
Past or current Entrepreneurship classes		
Yes, in the past	63	40.4
Yes, currently	14	9.0
No	41	26.3
Unknown	38	24.4
Completeness of Survey Instrument		% Completeness
Number of participants	156	= 71.15%
The number that completed the questionnaire	111	

Table 2-5: Univariate analysis of the missing data in the pilot study

ID	N	Mean	Std Dev	Missing		Number of Extremes	
				Count	%	Low	High
Q20	130	1.19	0.42	26	16.7	-	-
Q21	128	1.37	0.67	28	17.9	0	3
Q22	131	2.34	1.22	25	16.0	0	0
Q23	131	2.00	1.19	25	16.0	0	21
Q24	129	1.24	0.64	27	17.3	-	-
Q25	129	1.43	0.72	27	17.3	0	4
Q26	129	1.28	0.64	27	17.3	-	-
Q27	129	1.29	0.58	27	17.3	-	-
Q28	129	1.89	0.96	27	17.3	0	0
Q29	128	1.55	0.77	28	17.9	0	3
Q30	129	2.23	1.02	27	17.3	0	0
Q31	129	1.66	0.81	27	17.3	0	6
Q32	129	2.21	1.07	27	17.3	0	0
Q33	129	2.19	0.94	27	17.3	0	0
Q34	127	1.78	0.84	29	18.6	0	6
Q35	128	1.75	0.93	28	17.9	0	11
Q36	127	1.28	0.52	29	18.6	-	-
Q37	128	1.33	0.52	28	17.9	0	0
Q38	128	1.28	0.50	28	17.9	0	1
Q39	126	2.33	1.20	30	19.2	0	0
Q40	127	1.81	0.95	29	18.6	0	8
Q41	124	2.79	1.17	32	20.5	0	0
Q42	127	2.65	1.07	29	18.6	0	4
Q43	128	1.65	0.77	28	17.9	0	4
Q44	128	1.20	0.42	28	17.9	-	-

Table 2-6: Item analysis results of the original 25 items of the survey instrument showing item difficulty, variability, discrimination, and consistency scores

ID	Survey Items (N=131)	Item Difficulty	Item Variability	Item Discrimination	Item Consistency	Decision*
		Mean	Std Dev	Corrected item- totalcorrelation	Alpha if deleted	
Q20	Technical and vocational education and training (TVET) courses are needed in secondary schools.	1.19	0.41	0.378	0.782	Retain
Q21	Technical and vocational education and training (TVET) courses are needed in the universities	1.36	0.67	0.435	0.777	Retain
Q22	Technical and vocational education and training (TVET) courses should be available for any interested students	2.34	1.22	0.063	0.801	Remove
Q23	Technical and vocational education and training (TVET) courses should be available for students desiring a university degree	2.00	1.19	0.091	0.799	Remove
Q24	Technical and vocational education and training (TVET) courses should be available for students from any type of family	1.24	0.63	0.178	0.787	Remove
Q25	Technical and vocational education and training (TVET) courses should be available for students from all income levels in Nigeria	1.44	0.72	0.198	0.787	Remove
Q26	Technical and vocational education and training (TVET) courses should be made available in polytechnics	1.28	0.64	0.319	0.782	Retain

Table 2-6 continued

Q27	Sponsorship opportunities would enhance youth participation in technical and vocational education and training (TVET).	1.30	0.58	0.334	0.782	Retain
Q28	Enrolling in technical and vocational education and training (TVET) courses will improve my social status among peers	1.92	0.98	0.529	0.769	Retain
Q29	Technical and vocational education and training (TVET) courses are the best strategies to lead students into starting their businesses after graduation	1.59	0.81	0.502	0.772	Retain
Q30	Most parents would be willing to send their children to technical and vocational education and training (TVET) programs	2.24	1.01	0.305	0.783	Retain
Q31	Technical and vocational education and training (TVET) is an acceptable back-up plan if I fail to get my dream job after my formal (professional) training	1.66	0.81	0.376	0.779	Retain
Q32	Technical and vocational education and training (TVET) is highly regarded as an important career path in Nigeria	2.21	1.08	0.295	0.784	Retain
Q33	Most guardians would be willing to send their wards to technical and vocational education and training (TVET) programs.	2.19	0.94	0.301	0.779	Retain
Q34	There are long term career prospects for youth who choose technical and vocational education and training (TVET) programs	1.75	0.85	0.289	0.783	Retain**

Table 2-6 continued

Q35	Lack of adequate financing of technical and vocational education and training (TVET) is a barrier to employment for youth	1.76	0.94	0.181	0.789	Retain**
Q36	Provision of scholarship would enhance youth participation in technical and vocational education and training (TVET)	1.27	0.51	0.336	0.782	Retain
Q37	Technical and vocational education and training (TVET) provides youth with employable skills	1.34	0.54	0.358	0.782	Retain
Q38	Technical and vocational education and training (TVET) will enhance job creation among youth in Nigeria	1.29	0.58	0.411	0.780	Retain
Q39	Technical and vocational education and training (TVET) programs should be equivalent to getting a degree from a university	2.35	1.22	0.482	0.771	Retain
Q40	Technical and vocational education and training (TVET) should be made compulsory starting from secondary school education level in Nigeria	1.82	0.95	0.358	0.779	Retain
Q41	Technical and vocational education and training (TVET) has the same high standing as going to university for professional degrees	2.83	1.18	0.471	0.772	Retain
Q42	Enrolling in technical and vocational education and training (TVET) programs as a career path makes me equal to peers who are enrolled in a university	2.64	1.08	0.441	0.774	Retain

Table 2-6 continued

Q43	I would like to enroll in a technical and vocational education and training (TVET) program	1.66	0.78	0.491	0.773	Retain
Q44	Technical and vocational education and training (TVET) can reduce youth unemployment in Nigeria.	1.20	0.42	0.318	0.784	Retain

*Sequential removal was done based on the item with the lowest item discrimination values (values less than 0.3).

**Items have a discrimination value less than 0.3 however, their removal did not substantially improve the reliability, hence retained.

Table 2-7: Item analysis results of the final 21 items of the survey instrument showing item difficulty, variability, discrimination, and consistency scores

ID	Survey Items (N=131)	Item Difficulty	Item Variability	Item Discrimination	Item Consistency
		Mean	Std Dev	Corrected item-total correlation	Alpha if deleted
Q20	Technical and vocational education and training (TVET) courses are needed in secondary schools.	1.19	0.64	0.349	0.816
Q21	Technical and vocational education and training (TVET) courses are needed in the universities	1.36	0.58	0.401	0.812
Q26	Technical and vocational education and training (TVET) courses should be made available in polytechnics	1.28	0.64	0.245	0.818
Q27	Sponsorship opportunities would enhance youth participation in technical and vocational education and training (TVET).	1.30	0.58	0.304	0.816
Q28	Enrolling in technical and vocational education and training (TVET) courses will improve my social status among peers	1.92	0.98	0.613	0.799
Q29	Technical and vocational education and training (TVET) courses are the best strategies to lead students into starting their businesses after graduation	1.59	0.81	0.537	0.805
Q30	Most parents would be willing to send their children to technical and vocational education and training (TVET) programs	2.24	1.01	0.379	0.813
Q31	Technical and vocational education and training (TVET) is an acceptable back-up plan if I fail to get my dream job after my formal (professional) training	1.66	0.81	0.444	0.810

Table 2-7 continued

Q32	Technical and vocational education and training (TVET) is highly regarded as an important career path in Nigeria	2.21	1.08	0.392	0.813
Q33	Most guardians would be willing to send their wards to technical and vocational education and training (TVET) programs.	2.19	0.97	0.466	0.811
Q34	There are long term career prospects for youth who choose technical and vocational education and training (TVET) programs	1.79	0.85	0.229	0.820
Q35	Lack of adequate financing of technical and vocational education and training (TVET) is a barrier to employment for youth	1.76	0.94	0.186	0.823
Q36	Provision of scholarship would enhance youth participation in technical and vocational education and training (TVET)	1.27	0.51	0.349	0.815
Q37	Technical and vocational education and training (TVET) provides youth with employable skills	1.34	0.54	0.364	0.814
Q38	Technical and vocational education and training (TVET) will enhance job creation among youth in Nigeria	1.29	0.50	0.388	0.814
Q39	Technical and vocational education and training (TVET) programs should be equivalent to getting a degree from a university	2.35	1.22	0.452	0.810
Q40	Technical and vocational education and training (TVET) should be made compulsory starting from secondary school education level in Nigeria	1.82	0.95	0.371	0.813
Q41	Technical and vocational education and training (TVET) has the same high standing as going to university for professional degrees	2.83	1.18	0.456	0.809

Table 2-7 continued

Q42	Enrolling in technical and vocational education and training (TVET) programs as a career path makes me equal to peers who are enrolled in a university	2.64	1.08	0.471	0.808
Q43	I would like to enroll in a technical and vocational education and training (TVET) program	1.66	0.78	0.554	0.805
Q44	Technical and vocational education and training (TVET) can reduce youth unemployment in Nigeria.	1.20	0.42	0.299	0.817

Scale Mean (SD): 43.93 (8.89). Scale Reliability (Cronbach Alpha): 0.825

Table 2-8: Final Draft of the 21-item TAPS Instrument

S/N	Items	SA	A	U	D	SD
Q20	Technical and vocational education and training (TVET) courses are needed in secondary schools.					
Q21	Technical and vocational education and training (TVET) courses are needed in the universities					
Q26	Technical and vocational education and training (TVET) courses should be made available in polytechnics					
Q27	Sponsorship opportunities would enhance youth participation in technical and vocational education and training (TVET).					
Q28	Enrolling in technical and vocational education and training (TVET) courses will improve my social status among peers					
Q29	Technical and vocational education and training (TVET) courses are the best strategies to lead students into starting their businesses after graduation					
Q30	Most parents would be willing to send their children to technical and vocational education and training (TVET) programs					
Q31	Technical and vocational education and training (TVET) is an acceptable back-up plan if I fail to get my dream job after my formal (professional) training					
Q32	Technical and vocational education and training (TVET) is highly regarded as an important career path in Nigeria					
Q33	Most guardians would be willing to send their wards to technical and vocational education and training (TVET) programs.					
Q34	There are long term career prospects for youth who choose technical and vocational education and training (TVET) programs					

Table 2-8 continued

Q35	Lack of adequate financing of technical and vocational education and training (TVET) is a barrier to employment for youth
Q36	Provision of scholarship would enhance youth participation in technical and vocational education and training (TVET)
Q37	Technical and vocational education and training (TVET) provides youth with employable skills
Q38	Technical and vocational education and training (TVET) will enhance job creation among youth in Nigeria
Q39	Technical and vocational education and training (TVET) courses are needed in secondary schools.
Q40	Technical and vocational education and training (TVET) courses are needed in the universities
Q41	Technical and vocational education and training (TVET) courses should be made available in polytechnics
Q42	Sponsorship opportunities would enhance youth participation in technical and vocational education and training (TVET).
Q43	Enrolling in technical and vocational education and training (TVET) courses will improve my social status among peers
Q44	Technical and vocational education and training (TVET) courses are the best strategies to lead students into starting their businesses after graduation

SA: Strongly Agree, A: Agree, U: Undecided, D: Disagree; SD: Strongly Disagree

Table 3-1: Frequency distribution of the demographic characteristics of the study participants (N=810)

Variable	Frequency	Percentage
Age Categories	n = 624	
12-19 years	96	13.2
20-29 years	447	61.3
30-39 years	77	10.6
40 years and older	4	0.5
Educational Attainment	n = 621	
Secondary School	252	40.6
Polytechnic	88	14.2
Bachelor's Degree	187	30.1
Master's, PhD, Professional	67	10.8
TVET	10	1.6
Others	17	2.7
Ethnicity	n = 622	
Hausa	114	18.3
Igbo	138	22.2
Yoruba	289	46.5
Others	81	13.0
Gender	n = 613	
Male	319	52.0
Female	294	48.0
Marital Status	n = 619	
Married	77	12.4
Widowed/Divorced/Separated	13	2.1
Single/Never Married	529	85.5

Table 3-1 continued

Employment Status	n = 616	
Employed	250	40.6
Not Employed	366	59.4
Past/Current Training on TVET	n = 614	
Yes, in the past	291	47.4
Yes, currently	77	12.5
No	246	40.1
Past/Current Training on Entrepreneurship	n = 604	
Yes, in the past	118	19.5
Yes, currently	245	40.6
No	241	39.9

Table 3-2: Frequency distribution of the perception and attitude towards Technical Vocational and Training (TVET) among Nigerian youths

ID	Item	Total	SA	Agree	Undecided	Disagree	SD
Q1.	Technical and vocational education and training (TVET) courses are needed in secondary schools.	637	395 (62.0)	201 (31.6)	27 (4.2)	4 (0.6)	10 (1.6)
Q2	Technical and vocational education and training (TVET) courses are needed in the universities.	626	343 (54.8)	230 (36.7)	33 (5.3)	17 (2.7)	3 (0.5)
Q3	Technical and vocational education and training (TVET) courses should be made available in polytechnics	634	364 (57.4)	216 (34.1)	35 (5.5)	16 (2.5)	3 (0.5)
Q4	Sponsorship opportunities would enhance youth participation in technical and vocational education and training (TVET).	636	345 (54.2)	233 (36.6)	44 (6.9)	9 (1.4)	5 (0.8)
Q5	Enrolling in technical and vocational education and training (TVET) courses will improve my social status among peers.	636	268 (42.1)	271 (42.6)	72 (11.3)	20 (3.1)	5 (0.8)
Q6	Technical and vocational education and training (TVET) courses are the best strategies that lead students to start their businesses after graduation.	636	312 (49.1)	253 (39.8)	59 (9.3)	10 (1.6)	2 (0.3)
Q7	Most parents would be willing to send their children to technical and vocational education and training (TVET) programs.	635	194 (30.6)	276 (43.5)	119 (18.7)	39 (6.1)	7 (1.1)
Q8	Technical and vocational education and training (TVET) is an acceptable back-up plan if I fail to get my dream job after my formal (professional)	634	236 (37.2)	364 (47.9)	65 (10.3)	24 (3.8)	5 (0.8)

Table 3-2 continued

Q9	Technical and vocational education and training (TVET) is highly regarded as an essential career path in Nigeria	631	211 (33.4)	282 (44.7)	67 (10.6)	65 (10.3)	6 (1.0)
Q10	Most guardians would be willing to send their wards to technical and vocational education and training (TVET) programs.	630	164 (26.0)	307 (48.7)	114 (18.1)	39 (6.2)	6 (1.0)
Q11	There are long term career prospects for youth who choose technical and vocational education and training (TVET) programs.	627	229 (36.5)	292 (46.6)	80 (12.8)	21 (3.3)	5 (0.8)
Q12	Lack of adequate financing of technical and vocational education and training (TVET) is a barrier to employment for youth.	627	246 (39.2)	295 (47.0)	64 (10.2)	19 (3.0)	3 (0.5)
Q13	Provision of scholarship would enhance youth participation in technical and vocational education and training (TVET).	629	278 (44.2)	277 (44.0)	59 (9.4)	14 (2.2)	1 (0.2)
Q14	Technical and vocational education and training (TVET) provide youth with employable skills.	627	280 (44.7)	281 (44.8)	58 (9.3)	7 (1.1)	1 (0.2)
Q15	Technical and vocational education and training (TVET) will enhance job creation among youth in Nigeria.	628	307 (48.9)	268 (42.7)	43 (6.8)	6 (1.0)	4 (0.6)
Q16	Technical and vocational education and training (TVET) programs should be equivalent to getting a degree from a university.	631	203 (32.2)	281 (44.5)	83 (13.2)	58 (9.2)	6 (1.0)
Q17	Technical and vocational education and training (TVET) should be made compulsory, starting from secondary school education level in Nigeria.	632	205 (41.9)	283 (44.8)	53 (8.4)	27 (4.3)	4 (0.6)

Table 3-2 continued

Q18	Technical and vocational education and training (TVET) have the same high standing as going to university for professional degrees.	626	181 (28.9)	262 (41.9)	99 (15.8)	66 (10.5)	18 (2.9)
Q19	Enrolling in technical and vocational education and training (TVET) programs as a career path makes me equal to peers who are enrolled in a university.	626	174 (27.8)	255 (40.7)	112 (17.9)	69 (11.0)	16 (2.6)
Q20	I would like to enroll in a technical and vocational education and training (TVET) program.	630	250 (39.7)	314 (49.8)	51 (8.1)	12 (1.9)	3 (0.5)
Q21	Technical and vocational education and training (TVET) can reduce youth unemployment in Nigeria.	630	308 (48.9)	272 (43.2)	29 (4.6)	11 (1.7)	10 (1.6)

SA: Strongly Agree; SD: Strongly Disagree

Table 3-3: Model diagnostic from the Confirmatory Factor Analysis result of the baseline and post-modification TVET Attitude and Perception Scale (TAPS) models from a sample of Nigerian youths (n= 584)

Parameter	Baseline Factor Model	Post-Modification Factor Model
Chi-Square Statistic (χ^2)	1644.9	1244.4
Degree of Freedom (df)	189	186
p-value (χ^2)	<0.001	<0.001
RMSEA	0.108	0.090
90% CI	0.103 – 0.113	0.088 – 0.097
p-value (RMSEA)	<0.001	<0.001
SRMR	0.052	0.049
CFI	0.88	0.91
TLI	0.87	0.90
Model Modification		
Q7 with Q10		
	$\chi^2 =$	127.0
	p-value	< .001
Q16 with Q18		
	$\chi^2 =$	101.0
	p-value	< .001

Table 3-3 continued

Q18 with Q19		
	$\chi^2 =$	179.9
	p-value	< .001
Chi-square change		
	$\chi^2(189) = 1644.9 - \chi^2(186) = 1244.3$	400.55
	p-value	< .001

*RMSEA: Root Mean Square Error of Approximation; CI: Confidence Interval; SRMR: Standardized Root Mean Square Residual; CFI: Comparative Fit Index; TLI: Tucker Lewis Index

Table 3-4: Confirmatory factor analysis result showing how the items predict the latent construct, TVET Attitude and Perception Scale (TAPS) using the regression, intercepts, variances and R-square estimates from a sample of Nigerian youths (n= 584)

Item ID	Regression Estimate	p-value	Intercepts Estimates	p- value	Residual Variances Estimates	p- value	R-square Estimate	p- value
Q1	1.00	Ref	1.19	<0.001	0.30	<0.001	0.60	<0.001
Q2	1.07	<0.001	1.27	<0.001	0.37	<0.001	0.59	<0.001
Q3	1.06	<0.001	1.26	<0.001	0.33	<0.001	0.61	<0.001
Q4	1.11	<0.001	1.30	<0.001	0.31	<0.001	0.65	<0.001
Q5	1.18	<0.001	1.43	<0.001	0.39	<0.001	0.62	<0.001
Q6	1.09	<0.001	1.33	<0.001	0.31	<0.001	0.64	<0.001
Q7	1.31	<0.001	1.66	<0.001	0.56	<0.001	0.59	<0.001
Q8	1.22	<0.001	1.47	<0.001	0.38	<0.001	0.65	<0.001
Q9	1.26	<0.001	1.60	<0.001	0.63	<0.001	0.54	<0.001
Q10	1.29	<0.001	1.67	<0.001	0.56	<0.001	0.58	<0.001
Q11	1.22	<0.001	1.48	<0.001	0.40	<0.001	0.63	<0.001
Q12	1.16	<0.001	1.42	<0.001	0.37	<0.001	0.63	<0.001
Q13	1.15	<0.001	1.37	<0.001	0.29	<0.001	0.68	<0.001
Q14	1.12	<0.001	1.35	<0.001	0.27	<0.001	0.68	<0.001
Q15	1.09	<0.001	1.30	<0.001	0.28	<0.001	0.66	<0.001
Q16	1.25	<0.001	1.60	<0.001	0.57	<0.001	0.56	<0.001

Table 3-4 continued

Q17	1.20	<0.001	1.42	<0.001	0.37	<0.001	0.65	<0.001
Q18	1.24	<0.001	1.68	<0.001	0.77	<0.001	0.48	<0.001
Q19	1.29	<0.001	1.72	<0.001	0.82	<0.001	0.48	<0.001
Q20	1.13	<0.001	1.40	<0.001	0.33	<0.001	0.64	<0.001
Q21	1.05	<0.001	1.33	<0.001	0.42	<0.001	0.55	<0.001
Q7 with Q10	0.26	<0.001						
Q16 with Q18	0.17	<0.001						
Q18 with Q19	0.37	<0.001						
TAPS variance					0.46	<0.001		

Table 3-5: Results of the Multiple Indicator, Multiple Cause (MIMIC) Model showing the baseline and post-modification diagnostic indices of the items in the TVET Attitude and Perception Scale (TAPS) Model from a sample of Nigerian youths (n= 584)

Parameter	Baseline MIMIC Model	Post-Modification MIMIC Model
Chi-Square Statistic (χ^2)	1390.60	1363.15
Degree of Freedom (df)	186	263
p-value (χ^2)	<0.001	<0.01
RMSEA	0.080	0.079
90% CI	0.076 – 0.084	0.075 – 0.084
p-value (RMSEA)	<0.001	<0.001
SRMR	0.046	0.045
CFI	0.91	0.91
TLI	0.90	0.90
Model Modification		
Q2 on I-Y**		
$\chi^2 =$		15.7
p-value		< .001
Q7 with Sex		
$\chi^2 =$		11.31
p-value		< .001
Chi-Square post-modification		
$\chi^2 =$		1363.15
df		263
p-value		< .001
Chi-square change		
$\chi^2 =$		27.45
p-value		< .001

*RMSEA: Root Mean Square Error of Approximation; CI: Confidence Interval; SRMR: Standardized Root Mean Square Residual; CFI: Comparative Fit Index; TLI: Tucker Lewis Index. **Ethnicity dummy variables: H-Y: Hausa respondents compared against Yoruba respondents; I-Y: Igbo respondents compared against Yoruba respondents.

Table 3-6: Final confirmatory factor analysis of the Multiple Indicator, Multiple Cause (MIMIC) Model showing how the items predict the latent construct, TVET Attitude and Perception Scale (TAPS) and the measurement equivalence of the predictor variables on the survey items (n= 584)

Item	Regression Estimate	p-value	Intercepts Estimates	p-value	Residual Variances Estimate	p-value	R-square Estimate	p-value
Q1	1.00	Ref	1.21	<0.001	0.30	<0.001	0.61	<0.001
Q2	1.04	<0.001	1.24	<0.001	0.36	<0.001	0.60	<0.001
Q3	1.06	<0.001	1.28	<0.001	0.33	<0.001	0.61	<0.001
Q4	1.11	<0.001	1.32	<0.001	0.31	<0.001	0.65	<0.001
Q5	1.18	<0.001	1.45	<0.001	0.39	<0.001	0.62	<0.001
Q6	1.09	<0.001	1.35	<0.001	0.31	<0.001	0.64	<0.001
Q7	1.34	<0.001	1.73	<0.001	0.54	<0.001	0.59	<0.001
Q8	1.22	<0.001	1.49	<0.001	0.38	<0.001	0.65	<0.001
Q9	1.26	<0.001	1.62	<0.001	0.63	<0.001	0.54	<0.001
Q10	1.29	<0.001	1.69	<0.001	0.56	<0.001	0.58	<0.001
Q11	1.22	<0.001	1.50	<0.001	0.40	<0.001	0.63	<0.001
Q12	1.16	<0.001	1.45	<0.001	0.37	<0.001	0.62	<0.001
Q13	1.15	<0.001	1.39	<0.001	0.28	<0.001	0.68	<0.001
Q14	1.12	<0.001	1.37	<0.001	0.27	<0.001	0.68	<0.001
Q15	1.09	<0.001	1.32	<0.001	0.28	<0.001	0.66	<0.001
Q16	1.25	<0.001	1.62	<0.001	0.57	<0.001	0.56	<0.001
Q17	1.20	<0.001	1.45	<0.001	0.37	<0.001	0.65	<0.001
Q18	1.24	<0.001	1.71	<0.001	0.77	<0.001	0.48	<0.001
Q19	1.29	<0.001	1.74	<0.001	0.82	<0.001	0.48	<0.001
Q20	1.13	<0.001	1.42	<0.001	0.33	<0.001	0.64	<0.001
Q21	1.05	<0.001	1.35	<0.001	0.42	<0.001	0.55	<0.001

Table 3-6 continued

Latent Variable						
TAPS			0.38	<0.001	0.18	<0.001
Predictor Variable						
TAPS on Age	-0.01	<0.001				
TAPS on Sex	0.34	<0.001				
TAPS on H-Y	0.36	<0.001				
TAPS on I-Y	0.44	<0.001				
MIMIC Model Modification						
Q2 on I-Y	0.25	<0.001				
Q2 on H-Y	0.17	<0.001				
Q2 on I-H	0.17	0.721				
Q7 on Sex	-0.16	0.001				
CFA Model Modification						
Q7 with Q10	0.25	<0.001				
Q16 with Q18	0.18	<0.001				
Q18 with Q19	0.37	<0.001				

**H-Y: Hausa compared with Yoruba; I-Y: Igbo compared with Yoruba; Ref: Reference

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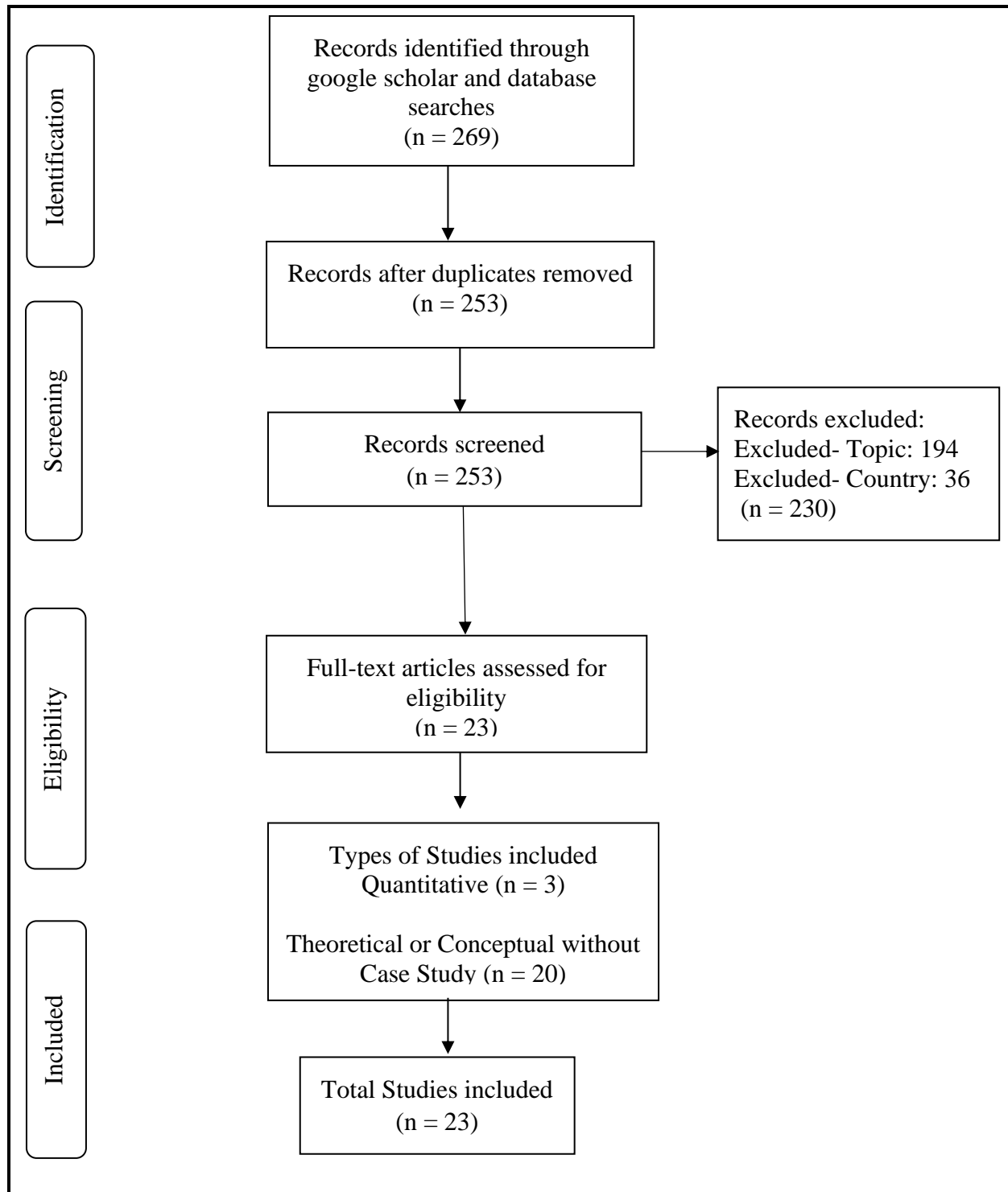


Figure A-1: The Flow Diagram showing data extraction steps using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines

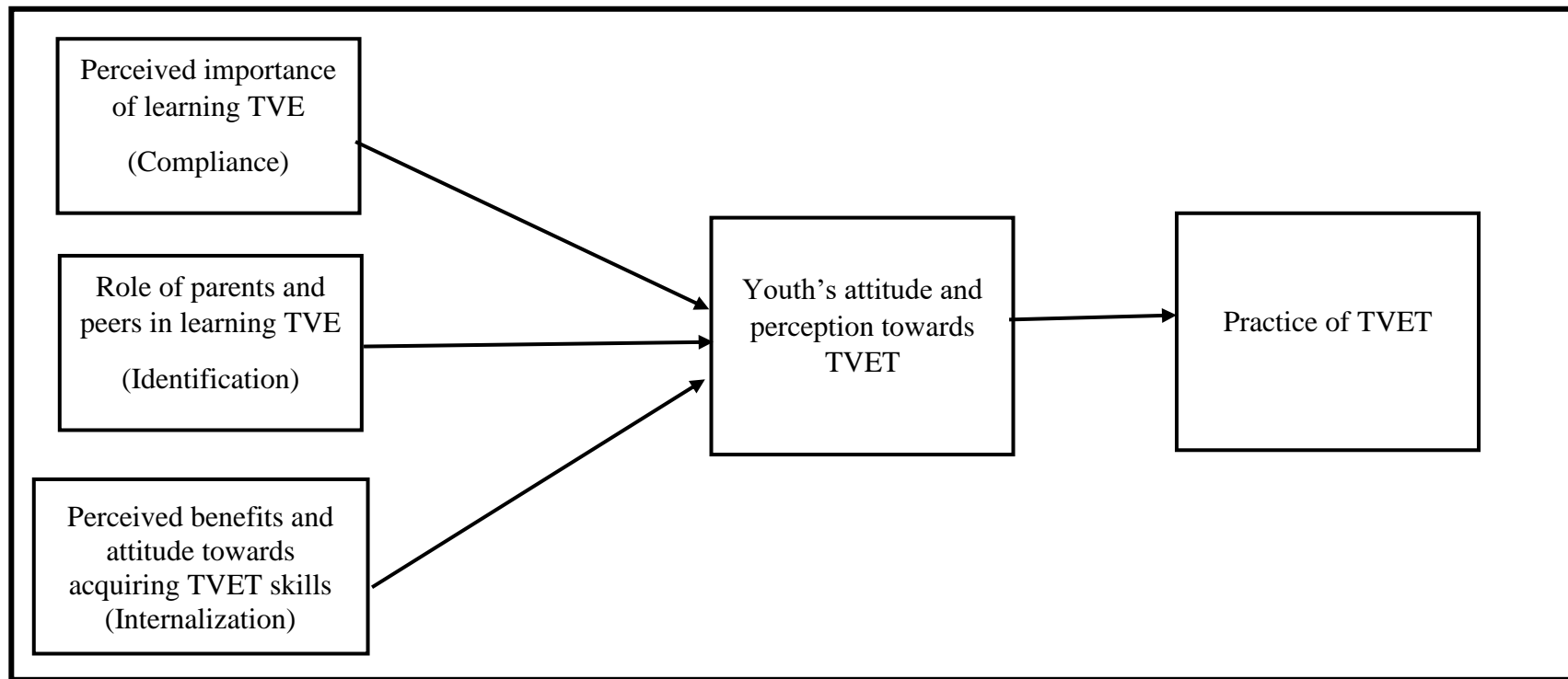


Figure B-1: *An adaptation of the social influence theory, using the domains of compliance, identification, and internalization, in creating a theoretical framework of youth's attitude and perception towards TVET.*

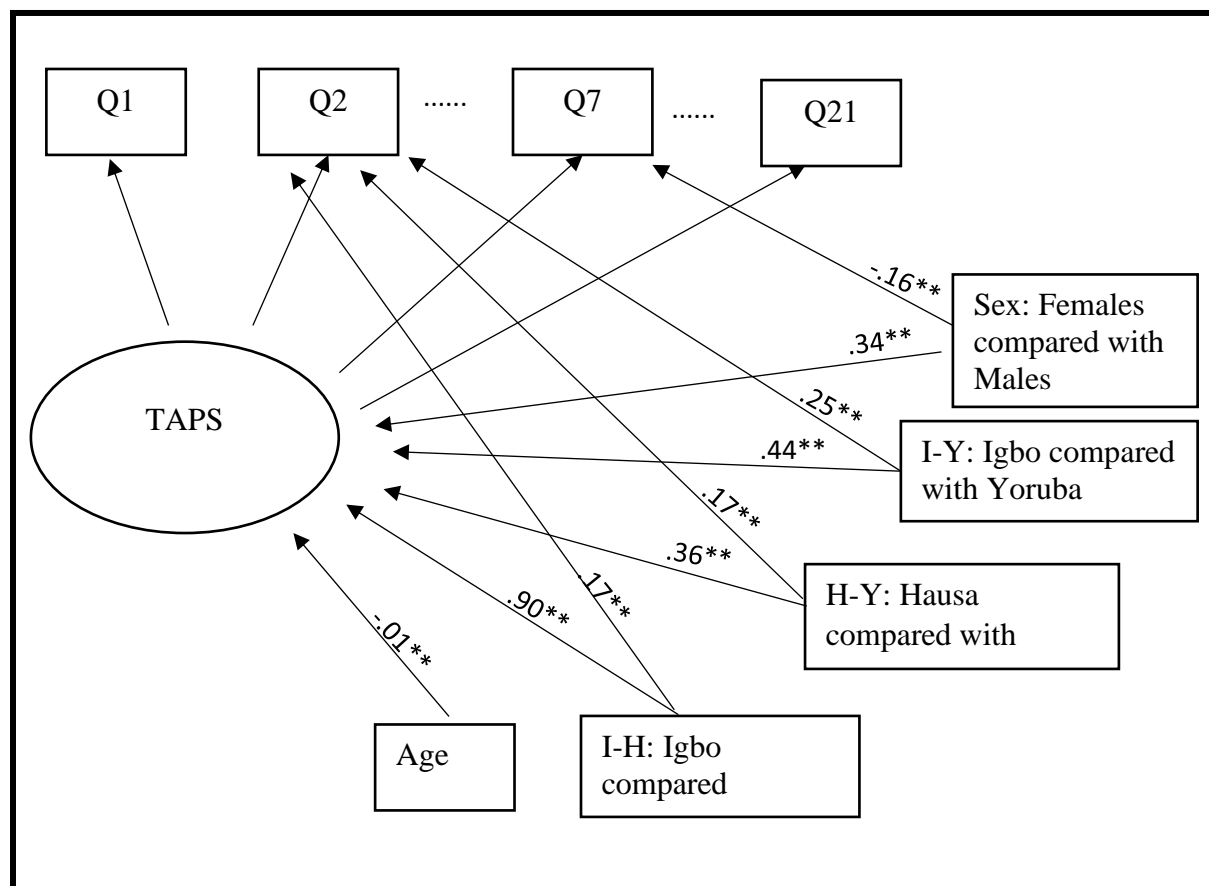


Figure C-1: Result of the Multiple Indicator, Multiple Cause (MIMIC) Model showing the relationship of the survey items and the latent construct and the measurement equivalence of the predictor variables ($n=584$). TAPS: TVET Attitude and Perception Scale; Q1-Q21: Items in the TAPS Survey; Ellipsis is used to account for items with measurement equivalence. * p -value < 0.05 ; ** p -value < 0.001 ;

VITA

Omotola Akinsola was born in Ibadan, Oyo, Nigeria, to Mojeed Kolawole Akinsola and Oludolapo Akinsola. She attended primary and secondary schools in Ibadan before attending college at Columbia College in Columbia, South Carolina. It was at Columbia College that she was introduced to the field of social work and the vital roles social workers play in micro, mezzo, and macro practice. With the mentorship and tutelage of exceptional professors like Dr. Diane Thompson, Dr. Hawkins, Dr. Burk, Dr. Linda Salane, and Dr. Ned Laff, she majored in Social Work and minored in Psychology and Leadership Studies, graduating from Columbia College in 2012.

She was inspired and encouraged to be a change agent on the mezzo and macro levels hence, she pursued this interest by obtaining her Masters of Social Work degree from the Washington University in St. Louis in 2013. Following graduation, she moved to Boulder, Colorado to learn from change-makers all around the world to be empowered as a change agent in the Social entrepreneurship field. Upon graduation from the six months of mentorship, she moved back to Nigeria to spearhead a nonprofit organization. The JumpStart Dream Academy focused on empowering youth while providing academic and leadership training to students in secondary schools to help them increase the graduation rate from secondary school and improving their chances of obtaining a university degree. It was during this time that she saw the effect of youth unemployment and the dangers it poses if not curbed, and this inspired her to expand her knowledge and understanding of this social problem. She continues to pursue this interest through her pursuit of a Doctor of Philosophy in Social Work at the University of Tennessee, Knoxville.