

International Journal of Vocational Education and Training

**Volume 26
Number 3
Winter 2021**

**Luke J. Steinke
Editor**

**Official Publication of the
International Vocational Education and Training Association
www.iveta.global**



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International Journal of Vocational Education and Training

Volume 26, Number 3

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Even though space does not permit us to include the names of many others who contributed their valuable time and talent in service to the *Journal*, we do thank them as well. Since 1993, they have served as associate editors; co-editors; guest, style, copy, and managing editors; managing reviewers; members of the editorial board; regional editors; and publishers.

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**International Journal of Vocational
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Volume 26, Number 3

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Articles do not necessarily reflect the position or policy of the International Vocational Education and Training Association or the Journal's editorial staff, and no endorsement by the association or editorial staff should be inferred.

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Message From the Editor

Welcome to winter! I hope everyone has a happy and safe holiday season. As we come to the close of 2021, I would like to thank everyone for taking the time to read the third issue of this 26th volume of the International Journal for Vocational Education and Training. This year we have had the opportunity to publish and share research within the field of Technical Vocation Education and Training (TVET) from a variety of different backgrounds, countries, and foundations. Hopefully you have found each issue of this 26th volume to be as information and interesting as I have.

This final issue of the year includes such topics as the evaluation of the Technical and Vocational skills possessed by basic technology teachers in junior secondary schools within Nigeria. Also included is an article focusing on the using TVET as a viable strategy to alleviate poverty within Nigeria, while another article focuses on sustainable partnerships in TVET in developing countries of Africa. This issue also includes an article looking at effective methods for developing TVET across the world, with a focus on instructional design methods for vocational training and apprenticeships. Finally, this issue includes an article looking at construction workers views on high school education as a barrier to success in their field.

As with many of our past issues, several of the authors are from countries across the world and English is not their first language. We have done our best to assist all our authors in correcting any spelling or grammatical issues to ensure their research is as effectively presented as possible. Due to the volume of manuscripts we receive, it is possible that the authors and the editorial staff overlooked some errors. We thank you for your understanding and patience in this regard.

In closing this volume of the journal, I would again like to thank everyone that made each issue possible. I truly appreciate everyone's patience, understanding, and support. We continue looking for both those interested in serving as reviewers for upcoming issues of the journal, as well as those looking to publish quality TVET research. I encourage anyone interested in serving as a reviewer for the journal or publishing their work in the journal to contact me at lsteinke@iveta.global.



Luke J. Steinke, PhD

Editor—International Journal for Vocational Education and Training

EVALUATION OF THE TECHNICAL AND VOCATIONAL SKILLS POSSESSED BY BASIC TECHNOLOGY TEACHERS IN JUNIOR SECONDARY SCHOOL IN LAGOS STATE FOR EFFECTIVE DELIVERY TOWARDS NATIONAL DEVELOPMENT

Oludolapo Jaiyeola Onipede, Maria Oluwatoyin Ogunkelu, Oladimeji Adebayo Obembe, Ojochide Rebecca Martins, and Chiso Anslem Njoku

ABSTRACT

The study sought to find out the evaluation of the technical and vocational skills possessed by basic technology teachers in junior secondary schools in Lagos state for effective delivery towards national development. The study used a descriptive survey design and was aimed at evaluating the technical and vocational skills possessed by basic technology teachers in junior secondary schools in Lagos State for effective delivery towards national development. To facilitate the achievement of the above objectives, three research questions guided the study. The population of the study comprised 30 pre-vocational education teachers in junior secondary school in Ojo local government area of Lagos State who teach basic technology. A 30-item validated structured questionnaire was developed and used for data collection. To establish the reliability of the instrument, the Cronbach alpha formula was used to determine the internal consistency of the instrument at 0.86. Data were analyzed using the mean to answer the research questions. The paper has the following major findings, that the teachers of basic technology do not possess adequate skills in woodwork technology, technical drawing, and information and communication technology, and where these skills are possessed, it is not adequately possessed, meaning that refresher training is needed. It was recommended that the identified skills items shortage which is required by basic technology teachers for effective delivery should be utilized for retraining of the basic technology teachers in woodwork technology, technical drawing, and information and communication technology for effective teaching of basic technology in junior secondary school, Modern tools and equipment should be adequately supplied and maintained regularly for improving practical projects in basic technology in junior secondary school and that Government should make funds available and sponsor basic technology teachers' attendance at conferences, seminars, and workshops on utilization of ICT for effective instructional delivery.

Keywords: *Evaluation, Technical and Vocational Skills, Basic Technology, Teachers and National Development.*

Introduction

The modern technology in the global space has called for a need for the teachers of basic technology to equip themselves with the new and modern skills required for improving practical projects of junior secondary school students since this is the foundation of technical and vocational education. Basic technology, formerly known as *Introductory Technology*, was structured to assist learners to develop an interest in technology. The aim is that by the end of the junior secondary school, presently known as basic 9, technological appreciation would have been activated and sustained, and a foundation laid for students' entrance into a vocation of their choice. Federal Republic of Nigeria (2007), National Policy on Education stated the three main objectives of Basic Technology as stated in the National Policy of Education (6th Ed. 2014) are:

- To develop the entire citizenry a strong consciousness for education and a strong commitment to its vigorous promotion.
- To provide compulsory, free, and universal basic education for every Nigerian child of school age.
- To reduce the incidence of drop out from formal school system through improved relevance, quality, and efficiency

And the goals of basic education are to:

- Provide the child with diverse basic knowledge and skills for entrepreneurship, wealth generation, and educational advancement.
- Develop patriotic young people equipped to contribute to social development and in the performance of their civic responsibilities.
- Inculcate values and raise morally upright individuals capable of independent thinking and who appreciate the dignity of labor
- Provide the technical knowledge and vocational skills necessary for woodwork, agricultural, commercial, economic development and give training and impart necessary skills to individual self-reliance economically

Miller, Bakare and Ikatule, (2010), opined that Basic technology is one of the essential pre-vocational and integrated subjects that are offered by students in junior secondary schools. It exposes students to basic ideas and concepts of technology and skill development in the various components that make up the subject. Aremu (2015) is also of the view that Basic technology is a foundation subject on which future technological development of students are built for those interested in vocational-technical courses or engineering in higher institutions. According to the basic technology is a compulsory subject in the 9-year basic education program. Its purpose according to the report is to contribute to the achievement of the national education goals by the inculcation of technology literacy, exposure of students to the world of work to match their

talents and interests for wise vocational choice, and inculcation of positive attitudes towards work as a source of human identity, livelihood, and power. Basic technology gives opportunities to students to use tools and machines used in the industries. This helps to develop good attitudes towards technology and the industry. Basic technology as a subject is very important for the scientific and technological advancement of any nation as its usefulness cuts across all fields of human endeavor (Onasanya, Fakomogbon, Shehu & Soetan, 2010). Uwaifo (2011), also stressed that the sole aim of the subject is to develop in children the aptitude for things that are technical and not necessarily making them technicians. Basic technology according to (Otamba, 2013), can be viewed as a subject taught in the junior secondary school with the incorporation of many skilled subjects such as woodwork, metalwork, electrical/electronics, mechanics, technical drawing, and local crafts to enable students at that school-age to be abreast with basic technological skills and competencies for useful living in the society. In this context, Basic technology can be seen as a technological foundation that prepares the interest of junior secondary school students in technical and vocational skills in the areas of safety, drawing, woodwork, hand tools, cutting tools, electrical, electronics, metalwork, automobile, building, and computer technology so that when they get to the senior secondary level they can be able to know what profession and skill to pursue.

Skill, according to Okorie (2000) is referred to as expertness in practical ability, dexterity, and tact. He explained that to possess a skill is to demonstrate the habit of acting, thinking, and behaving in a specific activity in such a way that the process becomes natural to the individual through repetition or practice. As a principle, vocational education will be effective in proportion as it trains the individual directly and specifically in the thinking habits and the manipulative habits required in the occupation itself. Ogwa and Nnachi (2016) remarked that to possess a skill is to demonstrate the habit of acting, thinking, or behaving in a specific activity that has become so natural to the individual through repetition or practice such that it becomes automatic.

The process of acquiring skill in basic technology as adapted from Holding (1985) involves the following methods which are: Identification of tools, use of tools, equipment, and materials and their care, Speed and accuracy of work done, Job planning and analysis of tasks, utilization of relevant principles and information, reading diagrams, symbols and drawing and understanding the summative evaluation of overall work done both in the workshop, laboratories and in drawing rooms. It should be noted that a basic technology teacher in junior secondary school should be conversant with this method for national development.

National development can be described as the overall development or a collective socio-economic, political as well as religious advancement of a country or nation. This is best achieved through development planning, which can be described as the country's collection of strategies mapped out by the government. Efajemue and Otuaga (2010) opined that national development includes: social, political as well as economic development strategies. For Nigeria as a nation to develop nationally, there is the need for the teachers of pre-vocational and technical education in junior secondary school to develop the right skill that will enable them to

impact the right knowledge and skills to the student of basic technology since it is the introductory aspect of vocational and technical education.

Teachers are the mainstay of the educational system (Afe, 2002). Teaching according to Suleiman and Nuhu, (2009), is a process of imparting knowledge, skills, and attitude to bring about a desirable change in learners. Teaching can also be referred to as an occupation, enterprise, and an act of explaining, reading, and writing. The primary goal of teaching is to ensure that meaningful learning occurs (Yinusa, 2014). Teaching effectiveness is the extent to which a student's performance improves after a period of instruction in a manner consistent with the goals of instruction (Olatoye, 2006). Johanesse, (2012) asserted that effective teaching is those activities that bring about the most productive and beneficial learning experience for students and promotes their development as learners. That is, teaching strategies utilized by teachers in technical and vocational education program must also improve in line with the changing needs of contemporary society (Okoye, 2010). Therefore, a good teaching strategy for technical and vocational skill acquisition lessons in Nigeria must possess certain qualities capable of bringing out the innovations and making the lesson student-centered activity. The following characteristics of teaching methods as outlined by (Okoye, 2010) are as follows:

- It should progress from simple activities to more complex tasks.
- It should possess qualities capable of arousing the interest and enthusiasm for active participation of the students.
- It should be flexible to accommodate the individual differences of the learners.
- It should be structured in such a way that it will satisfy the basic needs of the students.
- It should be motivating for achievement without boredom.
- It should link classroom activities with real-life activities.

It should be able to put into action all five senses (hearing, seeing, feeling, tasting, and touching) for effective retention of knowledge and transfer of skills acquired.

The technical and vocational skills teacher is expected to possess adequate and sufficient practical experience necessary for imparting the skills to the learners with appropriate teaching methods. That is why Ubong and Oguzor (2007) maintained that teachers and schools teaching technical courses should emphasize the practical aspects of the different specialties for technical and vocational education. Yinusa, (2014) argued that effective teaching goes beyond just imparting knowledge, but it is a purposeful activity carried out by someone with specialized knowledge in a skillful way to enhance the cognitive, affective, and psychomotor development of a person or group of persons in the subjects or course of study in which basic technology is one of it.

The major aim of Basic technology education in Nigeria is to explore the fundamentals and develop vocational competencies among youths so that they can appreciate the technological

world and contribute maximally to the nation's economic growth. The Basic technology curriculum provides that the teaching and learning of the subject should be both theoretical and practical in nature (NPE, 2004). To improve the achievement of students in basic technology, teachers are expected to be competent in teaching the content areas of the basic technology curriculum. This is because there is a decline in the academic performance in basic technology in the country (NECO chief examiner report 2015). This poor performance has been recorded for some years by the examining bodies of Junior Secondary Certificate Examination (JSCE), school promotion examinations, and the qualifying examinations conducted by the State Ministry of Education. This poor performance has been ascribed to the non-availability of skilled teachers for basic technology and the use of teachers who are not technically inclined to teach basic technology. It has also been recorded in the past according to Akpan, Usoro, and Akpan (2010), that pupils acquire skills in basic technology which makes them fit into the society properly and the reverse is now the case as students" on completion of the course cannot carry out simple daily maintenance on technological appliances.

Evaluation is the process of determining the extent of change in learners' behavior after teaching him/her a particular skill or area of knowledge. Okoro, (2000) is of the view that ultimate evaluation determines how well the individual performs in their place of employment after graduation. Nwacukwu (2003), also defined evaluation as the process of determining how much learning the learner in an educational setting has acquired. In general terms, it is the process of reaching decisions. It is obvious that the importance of this level of manpower to the development of Lagos State and Nigeria, in general, cannot be underestimated. Therefore, it is essential to know how the teachers of basic technology possess those skills that will enable them to impart the right knowledge and skills to the students for national development. Evaluation in this context will not be perceived as a measurement of students' success alone but also of teaching effectiveness and efficiency in using resources. Evaluation of this nature is necessary for the present Nigerian school system if education is to keep pace with time. Hence the evaluation of the technical and vocational skills possessed by basic technology teachers in junior secondary school in Lagos state for effective delivery towards national development. *

Research Questions

1. What are the woodwork technology skills possessed by the teachers of Basic Technology?
2. What are the technical drawing skills possessed by Basic Technology teachers?
3. What are the Information and Communication skills possessed by Basic Technology teachers?

Hypothesis

- H₀₁: Woodwork technical skills possessed by teachers of Basic Technology is not significantly different from average

- H₀₂: Technical drawing skills possessed by basic technology teachers are no different from average
- H₀₃: Information and communication skills possessed by basic technology teachers is not different from average

Methodology

A survey research design was adopted for this study. Survey research design is a plan structure, strategy that the enumerator wants to adopt to obtain situations to research problems using questionnaires in collecting, analyzing, and interpreting the data, (Olaitan, Ali, Eyo and Nwoke, 2005). The study was carried out in ten Junior Secondary Schools in Ojo Local Government. Purposive sampling was used to get ten schools that have basic technology workshops and teachers for basic technology. The population for this study comprised of all the 30 teachers that are teaching basic technology in these ten schools. The questionnaire for the study consisted of 30 items which were based on the research questions. Since the numbers of the teachers are not too large, the entire population was used because it is manageable for the study. A simple survey structured questionnaire was the instrument for data collection. The items used a 4-point response scale of highly possessed, averagely possessed, slightly possessed, and not possessed which were assigned numerical values of 4, 3, 2, and 1 respectively. The instrument was subjected to face and content validity. The instrument was trial tested on 30 basic technology teachers in Badagry Local Government. This yielded a reliability co-efficiency of 0.86 using the Cronbach Alpha formula. The data was collected by administering the questionnaire directly to the respondents by the researchers and two research assistants. The data collected from this study were analyzed using mean and standard deviation for answering the research questions. Any item with a mean value of 2.50 and above was regarded as high while any item with a mean below 2.50 was regarded as low.

Research Question 1

What are the woodwork technology skills possessed by the teachers of Basic Technology?

Table 1. Woodwork technology skills possessed by the teachers of Basic Technology

S/N	Item Statement	X	SD	t (p)	Remarks
1	Skills in using the drilling machine for boring hole on the wood surface accurately.	2.32	0.74	1.332 (0.193)	Not sig.
2	Skills in fixing hinges on door and cabinets perfectly.	2.48	0.74	0.148 (0.883)	Not sig.
3	Skills in using the circular saw machine for ripping wood perfectly.	2.20	0.86	1.991 (0.066)	Not sig.
4	Skill in reading the caliper	2.48	0.76	0.144 (0.886)	Not sig.
5	Skill in reading the tape rule.	2.72	0.91	1.324 (0.196)	Not sig.
6	Skills in using the work bench effectively.	2.53	0.87	0.189 (0.852)	Not sig.
7	Skills in using the Try Square effectively.	2.38	0.75	0.876 (0.388)	Not sig.
8	Skills, knowledge, and ability to work safely in the woodworking shop.	2.24	1.06	1.343 (0.189)	Not sig.
9	Skills, knowledge, and ability to read a basic shop print and translate from the drawing to which tools, materials, and processes must be utilized.	2.15	0.87	2.203 (0.036) *	Sig.
10	Skills in using the hand saws for cutting or sawing wood effectively.	2.31	0.69	1.508 (0.142)	Not sig.

Table 1 showed 10 woodwork technology skills possessed by the teachers of Basic Technology had mean values ranging from 2.15 to 2.72 with standard deviations indicating that the responses do not vary widely from the mean. The table also shows that while all the skills are not significantly different from the average of 2.5 ($p > 0.05$), only skills, knowledge, and ability to read a basic shop print and translate from the drawing to which tools, materials, and processes must be utilized is significantly below the average of 2.5 ($p < 0.05$).

Research Question 2

What are the technical drawing skills possessed by Basic Technology teachers?

Table 2. Technical drawing skills possessed by Basic Technology teachers

S/N	Item Statement	X	SD	t (p)	Remarks
1	Knowledge, skills, and abilities to apply geometric construction principles.	2.74	0.60	2.191 (0.037)	Sig.
2	Knowledge, skills, and abilities to apply mathematical calculations to technical drawings	2.56	0.78	0.421 (0.677)	Not sig.
3	Knowledge skills and abilities to draw a basic orthographic projection.	2.60	0.77	0.711 (0.483)	Not sig.
4	Skills in knowing the different types of lines	2.47	0.81	0.203 (0.841)	Not sig.
5	Skills in bisecting a straight line	2.71	0.60	1.917 (0.065)	Not sig.
6	Skills in constructing an angle	2.70	0.81	1.352 (0.187)	Not sig.
7	Skills in constructing of polygons	2.48	0.68	0.161 (0.873)	Not sig.
8	Skills in scaling of the work done.	2.35	0.69	1.191 (0.243)	Not sig.
9	Skills in drawing free hand.	2.15	0.83	2.310 (0.028)	Sig.
10	Skills in identifying first and third angle projection.	2.41	0.64	0.77 (0.447)	Not sig.

Table 2 showed that the basic technology teachers technical drawing skills had mean values ranging from 2.15 to 2.74 with standard deviations indicating that the responses do not vary widely from the mean. It also reveals that of the possessed technical drawing skills measured, most of them were not significantly different from the average value of 2.50 ($p > 0.05$). However, while knowledge, skills, and abilities to apply geometric construction principles are significantly higher than the average, skills in drawing freehand are significantly lower than the average ($p < 0.05$).

Research Question 3

What are the Information and Communication Technology skills possessed by Basic Technology teachers?

Table 3. Information and Communication Technology skills possessed by Basic Technology teachers

S/N	Item Statement	X	SD	t (p)	Remarks
1	Skills, knowledge, and ability to use the computer and internet safely - to keep personal information private, and avoid viruses, identity theft and other online threats.	2.38	0.92	0.714 (0.482)	Not sig.
2	Skills, knowledge, and ability to manage personal accounts for software, social media, and email.	2.47	0.63	0.261 (0.796)	Not sig.
3	Working knowledge of some of the basic languages used in coding and programming, such as Scratch, HTML, and Python.	2.36	0.77	0.996 (0.328)	Not sig.
4	Skills in browsing the internet effectively.	2.67	0.76	1.225 (0.230)	Not sig.
5	Skills in using teleconferencing.	2.14	0.88	2.241 (0.032) *	Sig.
6	Skills in connecting the computer to the printer effectively.	2.26	0.81	1.623 (0.115)	Not sig.
7	Skills in saving typed work to cloud, flash drive, hard drive and / or back-up drive	2.50	0.70	0.000 (1.000)	Not sig.
8	Skills in using of the PowerPoint effectively.	2.35	0.69	1.191 (0.243)	Not sig.
9	Skills in using the email effectively and sending data with it.	2.69	0.76	1.369 (0.181)	Not sig.
10	Skills in using ICT to teach basic technology effectively.	2.41	0.74	0.666 (0.511)	Not sig.

Table 3 showed that the basic technology teachers' information and communication skills had mean values ranging from 2.14 to 2.69 with standard deviations indicating that the responses do not vary widely from the mean. It also reveals that of the possessed information and communication skills measured, all were not significantly different from the average value of 2.50 ($p > 0.05$) except skills in using teleconferencing which is significantly lower than the average ($p < 0.05$).

Discussion

The findings showed that teachers of Basic Technology possessed average woodwork technical skills ($p > 0.05$) except for skills, knowledge, and ability to read a basic shop print and translate from the drawing to which tools, materials, and processes must be utilized which was significantly below average ($p < 0.05$). This implies that technical skills among the prevocational teachers in Ojo Local Government are not proficient, generally low, and seriously need improvement. This agrees with Jibrin, *et al.*, (2018) and Hassan, Dauda, & Badawi (2019) who found a below-average technical skills possession in woodwork among technical colleges teachers in Kano and Yobe State, Nigeria, and who also agreed on their need to improve on their skills possession. The findings on the non-significance of the mean of most of the skills from average agreed with Bakare, Omeje, & Okereke, (2018) who also found non-significant competencies of technologists who develop electro-mechanical contents in woodwork machine maintenance. The findings also agreed with Olorunyomi (2002) who pointed out that to ensure effective teaching and learning of manipulative skills, principals of technical colleges should endeavor to make sure that teachers deliver learning by making use of relevant tools and machines. This is also in agreement with Odu (2013) who lamented the unfortunate, recurrent absence of adequate facilities to foster effective teaching and learning of basic (technical) education since its inception. The implication of the result is that majority of basic technology teachers in junior secondary school who are supposed to be proficient in the skills they taught lack these skills and cannot “give what they don’t have”. This is because most time, teachers read textbooks to students without engaging them in practical activities, which has defeated the purpose for the establishment of prevocational technical education in junior secondary school.

The findings in table 2 showed that the teachers’ possession of eight of the ten skills measure was not significantly different from the average 2.5, only knowledge, skills, and abilities to apply geometric construction principles is significantly higher than the average ($p < 0.05$) while skills in drawing freehand are significantly lower than the average ($p < 0.05$). This agrees with researchers who posited that technology teachers in basic technology do not possess the needed competencies to teach practical skills and drawings as that will prick the interest of learners in learning woodwork technology through practice (Onaga, 2020; Amponsah, *et al.*, 2019; Amos, 2007). In most cases, the emphasis on theory rather than practice was a result of the lack of competence in delivering learning to the students because the skills are non-existent, or the teachers lack confidence in their ability. This is also in agreement with Ogwa (2002) who carried out a study on the causes of poor performance of students in Basic Technology and emphasized that some teachers who did not major in the subject were engaged to teach the same, hence the skills gap. The findings differed from Onaga (2020) who found above-average skills among building/ woodwork technology education graduating students in Enugu State. He further observed that many teach the subject with secondary school qualifications. Hence, the need to improve on the required skills cannot be over-emphasized as the gap between the required skills and the available or possessed skills are as wide as a gulf which concurred with Hassan, Dauda, & Badawi (2019).

The findings in table 3 showed that basic technology teachers possessed non significantly below average information and communication technology skills needed for effective delivery of learning. This agrees with the submission of various researchers who decried lack of competence in information and communication competence as a major challenge to the delivery of learning among teachers in Nigeria (Ikwuka, et al., 2021; Akpabio & Ogiriki, 2017; Oyekanmi, 2016). The findings also concurred with other researchers who strongly suggested that teachers must be provided with and have access to the necessary technological equipment training and resources that will enhance their skills in classroom situations and enrich students learning (Usman, Mika'ilu, & Nasiru, 2019; Bhattacharjee & Deb, 2016; Goro, 2000). They further stressed that teachers need quite a good number of infrastructures, training, educational facilities like machines, tools, equipment, and books in other to impact good knowledge to the students. Teachers need to be provided with good recreational facilities for their physical mental and social developmental growth.

Conclusion

Functional pre-technical and vocational education requires the handling of tools and machines to acquire the necessary skill. The introduction of basic technology in junior secondary school is to encourage the acquisition of practical as well as vocational skills by students so that they can use their hands in making and repairing items that are made of wood, metals, and skill in information and communication technology. It was discovered that some basic technology teachers lack skills in woodwork technology, technical drawings, and information and communication technology. It was also noted that these skills are needed for the students to acquire prevocational skills.

Recommendation

Based on the findings of the study, the following recommendations were made:

1. The identified skills items shortage which is required by basic technology teachers for effective delivery should be utilized for retraining of the basic technology teachers in woodwork technology, technical drawing, and information and communication technology for effective teaching of basic technology in junior secondary school.
2. Modern tools and equipment should be adequately supplied and maintained regularly for improving practical projects in basic technology in junior secondary school.
3. Government should make funds available and sponsor basic technology teachers' attendance at conferences, seminars, and workshops on utilization of ICT for effective instructional delivery.

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INSTRUCTIONAL DESIGN FOR VOCATIONAL EDUCATION AND TRAINING: A CASE FOR EFFECTIVE VOCATIONAL TRAINING AND APPRENTICESHIP PROGRAMS ACROSS THE GLOBE

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ABSTRACT

Instructional design for vocational education and training programs has traditionally struggled to meet their desired goals. In particular, apprenticeship programs across the globe have expressed a desire for more effective instructional design methodologies that better fit their learners and expected outcomes. With significant workforces shifts following a global pandemic impacting all industries, it is particularly important for vocational education and training such as apprenticeship programs to revisit their training practices. This article explores the current status of apprenticeship programs across the globe and the challenges they are facing, takes an in-depth look at the traditional training concerns experienced by apprenticeship programs and why they exist, and finally provided an effective method for overcoming these concerns. Throughout the article the authors offer suggestions based on existing research, as well as their vast experience and knowledge with designing effective apprenticeship training programs.

Keywords: *Skill, Apprenticeship, Training Concerns, Occupational Analysis, Behavior Change, Instructional Design, Evaluation*

Introduction

Global participation in apprenticeship programs is increasing. According to the US Department of Labor, the number of new apprenticeship programs has sharply increased over the past several years with over 13,500 new programs created in the last five years alone. In this time, participation in apprenticeship programs has also increased significantly, with annual new apprentices exceeding 200,000 every year since 2018 (U.S. Department of Labor, 2021). With the goal of any good apprenticeship program is to deliver apprentices that can perform successfully on the job, many programs struggle to achieve optimal results. Issues range from completion levels hovering around 50-60% average to apprentices leaving being less prepared to perform on the job than expected by employers with estimates of less than 30 % of skills transferring to the job site (U.S. Department of Labor, 2021). With the pandemic requiring a global economy many industries must rethink how they operate and train new workers, it is critical that skilled trades and apprenticeship training determine the most effective means of addressing this.

Vocational Training and Apprenticeships

The current college loan debt debacle has squarely placed a focus on other forms of post-secondary education in the United States (Dickler, 2021). Meanwhile, international vocational training organizations have weighed in on the need for colleges and universities to make serious advances in the area such as of micro-credentials (Vella, 2021). With these shorter, more competence/skill focused educational and training efforts underway, the time seems ripe for apprenticeships to take a foothold as many employers continue to indicate a shortage of skilled workers (Wyman, 2020). Which begs the question: What is the value of a college education if graduates are unprepared for the world of work?

For too long, apprenticeships in the USA have been concentrated at the post-secondary level and mainly in the construction sector. Following interests stirred up by Harvard's "Pathways to Prosperity" report (Symonds, Schwartz, & Ferguson, 2011), the Obama Administration invested millions of dollars of grant funding to grease the skids to grow registered apprenticeships across all industries (Putre, 2015). Several European countries (i.e., Switzerland, Germany, and England) have made a cottage industry out of providing "Apprenticeship Tours" to numerous government, business, and education groups from the USA over the past decade. Much to the surprise of many of those visitors, apprenticeships in these European countries are concentrated at the secondary level of schooling and cover everything from baking to banking to bricklaying. Imagine a high school student graduating with the knowledge, skills, and ability, to perform the work of a plumber or electrician at the journey level (Redden, 2017).

In order to attract and retain workers in what many laypeople view as jobs of old (aka: the 3Ds: dirty, dark, and dangerous), these industries will need to collaborate with public and private groups in ways that may seem very unusual, as follows:

1. Today's workers need and want a voice. So, in regions absent of union representation, it will be incumbent upon businesses to help create safe places for workers to legitimately air their concerns.
2. Younger apprentices want to learn utilizing the latest technologies. Many (blue-collar) apprentices will tell you that they did not go on to college because of their dislike for traditional learning formats during their K-12 years.
3. New workers expect that a company will address their mental safety just as much as their physical safety in today's workplace. COVID-19 has placed the issue of mental health on everyone's dinner table; it is time to *Stop the Stigma!*
4. Non-traditional industries need to step up and pilot programs at the secondary level to ensure that students have the skills these firms desire sooner rather than later. The Swiss and German models send clear signals to the youth that their success grows the company and community.
5. In seasonal industries like construction, firms need to take a long-term view and find meaningful work for apprentices when times are slow. Loyalty cuts both ways; investing in apprentices to ensure a steady source of income during the early stages of apprenticeship is bound to pay future dividends.
6. You get what you pay for! If you are seeking to hire employees who care then show that you care. To start, this means paying a living wage (\geq \$15 per hour)...as well as providing health care, retirement, and training benefits.

Traditional Vocational Training and Apprenticeship Program Concerns

With all these factors impacting current apprenticeship programs both in the United States and abroad, it is important to look at how these apprenticeship programs have been traditionally designed and delivered. While many factors cause vocational training programs to underperform, program directors most commonly identify variables within the programs themselves to be the most challenging. One of the most discussed concerns is that programs tend to be more knowledge-focused than skill-focused. While skills are addressed within the program, many feel that a knowledge-heavy focus has led to instruction that more mirrors the traditional K-12 classroom format. Training program directors, instructors, and apprenticeship coordinators alike recognize that this is not always the optimum learning environment for trades focusing on hands-on skills. Additionally, this traditional format tends to focus on knowledge tests and certifications, which at times lacks clear measures of behavioral/skill change. Program directors commonly ask for clear measures of performance that are both valid and reliable. They require methods that reflect the work skills applied on the job and a way to measure those within their training program, yet often find that a trainee's performance on a knowledge-based test does not adequately translate to performance on the job. And finally, discuss the need to review the overall sequence of the training they provide. There are often questions about

whether the skills being learned by someone within the training program are appropriate for the work they are performing at that time on the job. In other words, are first-year skills learned being applied in that first year on the job site or factory floor or are some of those skills not being used until much later. This has led to concerns that in some instances, there may be overtraining or even undertraining taking place.

One of the significant changes to the workforce after the pandemic is the number of individuals changing careers (Castrillon, 2021). It is estimated that nearly 40% of the workforce have indicated they are planning to leave their current employer, with a quarter saying they are looking for new careers. With an average age for apprentices currently closer to 28 years of age (Statistics Canada, 2017; State of California, 2018), training program directors are recognizing that training programs not only need to be designed to meet the needs of employers, but it also needs to be set up to address the needs of an increasingly older population. These adult workers, and “adult learners” coming in with previous work experiences and life responsibilities, do not always find success in a traditional learning environment. They desire a learning environment that allows an opportunity to earn credit for prior learning experiences, self-direction, and offers personalization and flexibility in learning. This concept of adult learning or andragogy (Knowles, Holton, & Swanson, 2005) differs from pedagogy or the traditional concept used in education focusing teaching and learning as it often relates specifically to child. With the pressure to know exactly what industry wants, while maintaining a balance between costs and results produced, those with the responsibility of managing an apprenticeship program need clear methods to improve their programs.

Why Do These Concerns Exist?

It is important to point out here that while the authors will be discussing these concerns in relation to vocational training and apprenticeship programs, these concerns are not unique to training within the trades in general. Most occupational training programs, regardless of occupation, struggle with knowledge-centered training, developing curricula that is directly connected to and adequately transfers into performance on the job, as well as a means to adequately measuring performance. The good news is that the fix to these concerns is not as complex as many within the talent development or vocational education field would have you believe. The following is a summary of causes for occupational training concerns.

The first reason is programs have not adequately determined what specifically goes into their training program. At times this is because there is a perception that conducting some form of training analysis upfront will take too long to complete or the effort to conduct such an analysis will be less than fruitful. This is due to some organizations conducting such forms of needs assessments as learner analysis, surveys and questionnaires, or task analysis. The results of such efforts, in general, can take time to complete and often reveal more data than is useful to the development of an effective curriculum. Therefore, to forego what has historically been an inefficient exercise, training programs produce content based on the perceived needs of employers, what has traditionally been taught, and what learners are interested in knowing.

Organizations that do not simply forego analysis altogether, conduct a simplified version they perceive to save time which tends to result in limited useful data. The overall results of this lack of or limited analysis is a training curriculum that is primarily knowledge-based, disconnected from the skills required on the job, often provides over-training of some skills while under-training others, and is unlikely to transfer into successful workplace performance. Successful training analysis methodologies need to properly identify what is expected of someone on the job. When curriculum designers know the expected performance, instruction can be designed to focus on skill development.

The second reason is that training content is often taught out of sequence. This is often done because training designers perceive learners require foundational skills early on or that more difficult skills need to be taught later into one's career. The reality however is that the overall difficulty or perceived importance of skills is irrelevant when compared to when someone needs to perform that skill on the job. As an example, if we are to train an apprentice on skills in their first year that are only required on the job of a third-year apprentice, it is not reasonable to assume they will remember and apply that training when it is needed. Skills that are not used, are often lost regardless of the quality of instructors or curriculum (Adams, Hogan, & Steinke, 2020). Properly sequencing skills ensures that individuals perform when expected, curriculum designers and instructors know where to start, and learners are not overloaded with too much too soon.

The third reason is a lack of performance measures or measures for behavior change. The measures most often developed to test a learner's ability to apply their skills are often not closely related to the kind of performance required in the occupation. Organizations need to conduct an analysis to clearly identify observable skills and the minimum level of skill performance required for someone to perform on the job. When this is not done, programs have been forced to rely on the information or subject-matter focused evaluations. This also makes it difficult to adequately evaluate the skills of incoming trainees. As previously discussed, many learners are coming into occupations later in their careers and have past work experience. For an organization to recognize the experiences of these new employees, it is critical that they not only have identified what specific skills are needed but have a valid and reliable means of measuring this experience upfront.

The final reason that the authors will discuss here is how training is traditionally set up. With much of the instruction within vocational training and apprenticeship programs directly mirroring that of a K-12 classroom, it is important to recognize how this might impact overall learning. While this form of instruction has its merits, it is not without significant challenges. Most employers desire to have self-directed workers, critical thinkers, and workers who have a heightened sense of awareness. These "soft skill" characteristics are difficult to achieve through instruction and transfer onto the job (Laker & Powell, 2011). Therefore, these characteristics are best developed through building them into a system individuals participate in every day, and this begins with how they are trained. The traditional classroom and instructional methodology can place the learner in a passive state of development. They are spoon-fed information and expected to repeat what they are told or read through exams or assignments that are at best

loosely connected to job performance. This practice leaves little room for self-direction, critical thinking, or any of the other desired soft skill characteristics. Organizations need to create a training system that not only develops the direct skills needed to perform on the job, but also allows learners to develop the soft skills and characteristics they desire in an employee.

Instructional Design to Overcome Concerns

Designing vocational training and apprenticeship programs that address each of these concerns can be a true challenge for program developers and training managers. The purpose of this paper is not to advocate for one instructional design technique over another, but to identify the key characteristics and factors that program developers should be looking for in selecting models and techniques to guide their development efforts. The following will be looking at characteristics related to training that addresses each of the concerns discussed.

Training Needs Assessment and Analysis

In order to overcome the challenges and concerns with traditional vocational training and apprenticeship programs, it is important to begin with a solid foundation. This foundation is developed through a detailed and thorough analysis. With many organizations struggling to conduct effective upfront training analysis or skipping it altogether, it is important here to identify what has been found to be most effective. When looking at the different types of analysis and where to collect data, program developers have many options from direct observations, to questionnaires, through organizational documentation (Morgeson, Brannick, & Levine, 2020). The questions are: what are the most effective techniques for gathering data, what specific data are needed to develop effective training, and what/who should determine this? The following are techniques and methods identified as being the most impactful, while still maintaining a fast and efficient process.

It has been determined that using some form of occupational analysis to determine what is done on the job is the most effective form of analysis (Adams, Hogan, & Steinke, 2018b). One of the reasons for this is because this type of analysis is a full analysis of the work being done. When comparing the results of this process versus the likes of learner analysis, task analysis, content analysis, or organizational analysis, the occupational analysis process yields data that most accurately and adequately leads to the development of an effective vocational training curriculum. One aspect that these forms of analysis is the overall speed and efficiency of the processes. While occupational analysis processes are low cost and quick to apply, processes such as task analysis are often very expensive, time-consuming, and difficult to apply (Seamster, Redding, & Kaempf, 1997).

What makes occupational analysis processes so effective involves several factors. These factors are important for program developers to identify when selecting the best possible methodologies to implement. One of the factors involves the type of data collected during the analysis. Within analysis, there are many different units of analysis. These range from duties

and tasks to activities and worker characteristics, KSAs (Knowledge, Skills, and Abilities), competencies, to various job dimensions. While each of these has merit and can be used to develop a vocational training curriculum, the author's experiences have found that focusing on competencies and skills has been determined to be most effective because, skills are trainable, have an expected level of performance, and are measurable (Adams, Hogan, & Steinke, 2020), they tend to allow for the immediate development of curriculum. Gathering data such as knowledge generally leads to focusing on knowledge-based curriculum and focusing on tasks typically leads into further complicated forms of analysis before curriculum development can begin.

Occupational analysis methodologies that are most effective have also been ones where data were gathered from expert workers currently employed within the field. This is different from some forms of analysis where data are gathered by supervisors, current trainers, or others who may have some experience within the occupation, but often do not have the same current knowledge of the field. Because supervisors generally focus on competencies and skills different from those they are supervising, they may not be familiar with the day-to-day skills that are needed. Trainers tend to want to focus on the skills that are currently taught and may not be familiar with what skills are really needed to perform on the job and when. It has also been identified as most effective when these expert workers are determined by their peers versus being solely determined by administrators and supervisors. It has been found that often who supervisors deem most expert are instead individuals that they personally like or only have expertise in a narrow set of skills. Peers are a much more reliable source for determining who has the greatest level of expertise.

How data are collected during an occupational analysis can also vary. These techniques include such methods as direct observations, individual interviews with experts, questionnaires and surveys, reviewing records and internal documents, and group interview techniques (Morgeson, Brannick, & Levine, 2020). When conducting occupational analysis, we have found that such techniques involving groups to be the most effective. More specifically methods such as the nominal group technique, which is a structured group-based technique used to build consensus, has shown the most promise. This is because in such a group setting a knowledgeable analysis coordinator can provide guidance on the type of data that are needed for the analysis, they have a chance to build on each other's ideas, and perhaps most importantly create buy-in amongst respected workers within the organization. Methods such as surveys have often been found to be less than promising data as the instrument is limited during development and open to interpretation by the respondent (Kelly, Clark, Brown, & Sitzia, 2003). Even the best survey methods require a lengthy process to establish the instrument's validity and reliability, and even when such statistical requirements are met, surveys used to analyze occupations often over or under analyze for the purpose of curriculum development.

An important phase in the training needs assessment process is determining when the skill is needed. Doing so enables curriculum designers to develop training for the right time, and program development to provide the training when it is appropriate. In looking at various methods for establishing the sequence of training during the analysis process, several methods

suggest looking at such factors as frequency of performance, importance of the skill or task, difficulty of performing or learning the skill or task, or even criticality/consequences of error. While all of these appear to be logical directions to look at, we have found that curriculum designers have struggled with effectively understanding how to use this information to implement training. The authors have identified several reasons for this. First, when it comes to work on the job, all skills are important. How important something is typically rated by someone is often directly associated with their biased perception of the skill. Similarly, how frequently a skill is performed is subjective. When gathering data from expert workers, these individuals may perform certain skills frequently due to their seniority and skill level on the job. If these data were used to sequence training, new workers would be learning skills upfront that would not be expected of someone much later in their careers. Difficulty is also a challenging factor for trainers. What should be trained first, easier skills or more difficult skills? What about skills that are critical or have a higher consequence for getting incorrect? These are questions most program developers and trainers struggle with. The answers however become clearer when we focus on sequencing the data based on when a skill is expected to be performed on the job. This is because when focusing solely on when a skill is required, training is delivered at the right time regardless of how difficult or critical it might be. This reduces the risk of providing training on a perceived difficult or critical skill early on when someone is not expected to perform it. Trainers know that behavior that is not immediately reinforced or used on the job, is unlikely to effectively transfer (Fitzgerald, 2002). When the analysis process focuses on the sequencing based on when someone is expected to perform skills on the job, training programs can be organized into the desired learning sequence to provide training when it is needed. This helps reduce on-boarding time, errors in job performance, and does not overburden learners with too many skills at once.

The final element that we have identified as being critical to determine within the analysis phase is the required level of performance for the skill. This step is often overlooked for a few reasons with the most common being a lack of a valid and reliable measure of performance. While organizations might have measures they use for performance evaluations, these often do not adequately reflect what is done on or specifically transferred onto the job (Burke & Hutchins, 2008). Program designers should identify an adequate measure that can be effectively used to measure performance across all skills required on the job and that reflects the way someone will be observed and assessed within the work environment. One such valid and reliable rating scale that exists for performance was developed by Adams in 1968 (Adams, Hogan, & Steinke, 2018a). His 7-point scale was developed specifically to distinguish between observable levels of performance at work. The authors have found that Adams' rating scale (and rating scales similar to it) can be effectively applied to measure performance in a variety of occupations. Applying such ratings during the analysis making it easier for program developers to create learning activities that accurately reflect the required level of skill on the job. Once a valid and reliable measure is determined, the next struggle trainers often have is what level of skill should be the focus. In other words, all employers would prefer for each employee to be at the highest level of skill, however, is this a realistic goal. Such a desire often leads training designers to create learning that far exceeds what an employee needs to effectively perform on

the job. To avoid such over-training, it has been found that focusing on the minimum level of skill required to perform yields the best results. The minimally acceptable level of skill focuses on a level of skill that an employer is satisfied an employee reaches but may never exceed. The reality on the job is that many skills do not require greater speed and efficiency nor does one need to reach a level where they can supervisor others. They simply require that someone can perform them adequately enough to not need constant supervision and/or assistance (they can do it effectively by themselves). If someone, through training and experience exceeds this level of performance, the employer is happy. However, if not, the employer is at least satisfied that the employee is meeting the minimum expectation. Much like the proper identification of what someone does on the job (competencies and skills) and when it is needed (sequencing), determining the minimum level of skill helps set clear expectations for both employers and the employees within the organization.

Focusing on these factors during training needs assessment have shown to be both be fast and effective. On average, gathering these data have taken less than a month from start to finish. Often the factor found to be the most challenging for organizations is providing expert workers for the analysis. This is due to using a technique such as nominal group which requires in-person participation for up to three full days. It is often difficult for organizations to lose those individuals from the job site for that length of time. It is therefore important that training designers and coordinators be flexible in their scheduling, work with organizations to provide incentives to expert workers who participate and remain in open communication with organizational leadership about the process and potential results. When such an analysis process is completed, it more easily leads into a fast and efficient curriculum design process as well. Program developers however need to be aware of the essential curriculum design factors so that the work done during the analysis phase is applied in the most effective way.

Curriculum Development

When the analysis is conducted and a training needs assessment has determined what goes into the training program, when the training should be delivered, and the level the learner should reach, curriculum development is rather efficient. Yet when revisiting the challenges that vocational training and apprenticeship programs face, one can see that despite an effective analysis, curriculum development decisions can be made that undermine its effectiveness. To ensure that all the analysis work is most effectively, the authors have found that it is helpful for organizations to rethink their instruction. Most vocational training and apprenticeship programs follow a traditional learning model. Instruction is often classroom-based, knowledge-based, group-oriented, test-driven, instructor-focused, and subjectively evaluated. This can be linked to the more traditional pedagogical teaching and learning techniques that trainers are familiar with. Any study of vocational training curriculum at the higher education or corporate level will find multiple lessons on presenting materials, developing tests and exams, and being a motivator in the classroom. Yet when one looks at vocational training and apprenticeship “programs” focus,

we see that this traditional type of classroom instruction is rarely effective in developing and transferring skills onto the job. Additionally, these forms of instruction are rarely cost or time-effective, have higher attrition rates, and overall do not develop a self-directed learner/employee (Adams, Hogan, & Steinke, 2017).

In implementing various forms of training within different occupations, the authors have been able to identify some methodologies that have shown significant promise. The following outlines these various techniques and provides recommendations for vocational training and apprenticeship professionals looking to design a more effective curriculum.

When vocational training designing curriculum, it is recommended the most learning be individual. In designing learning this way, there are several suggested ways to ensure this focus. First, individual learning packages should be developed for each skill. While this may sound like a lengthy and cumbersome process, it does not need to be. For each skill, specific learning and audio-visual materials can be quickly created to help someone learn how to perform and apply the skill at the necessary level. Unlike many traditional training programs which provide excessive amounts of information such as book chapters, lengthy training videos, and detailed lectures on a broader subject matter, these learning packages only focus on the information needed for the skill. This is often only a paragraph or page out of more traditional learning resources and videos can be quickly created demonstrating how to apply the skill. Learning activities are also provided to the learner so that they can practice the skill. These learning activities are not subjective tests or traditional classroom assignments, but actual opportunities to practice the skill. Learners should have the opportunity to safely practice, receive feedback, and even fail at performing skills. Training directors have often commented that training schools are the place to make and learn from mistakes, versus doing so on the job where safety and costs are a major concern.

Additionally, as the planning and organization of training are based entirely on individual learning, individual trainees can begin the program at different times, progress at their own rate depending on their own ability and aptitudes and select learning goals based on personal interests. The only time they receive group instruction is when two or more feel they could best learn some aspect of their work as a group (Adams, 1969). This changes the need for traditional instructors. Instead of instructors focused on group presentations, lectures, and test development, their focus turns to that of a coach or guide to learners. Their efforts are best utilized to develop effective learning resources, demonstrating performance when necessary, and providing necessary feedback on performance. These instructors must have expertise in the field so that they can provide this feedback and evaluate skills when required. Since it is unrealistic for instructors to have expertise in all the skills within an occupation, it is highly recommended that program developers identify other individuals within the organization that have expertise in each skill. This way learners have multiple human resources to turn to for guidance if they are struggling with learning a skill or need someone to evaluate their progress.

This type of individual learning environment has multiple benefits. First, it reduces the amount of time it required for training and the need for arbitrary time-based training sessions. There is no need for programs to block out time during a week for multiple learners to attend a training

session. Learners instead can participate and practice their skills when they have free time. Another benefit to this format is that learners are not all forced to learn at the same time and speed. It is no secret that learners have varying previous work experiences, skill sets, and learn at different paces. The traditional classroom forces them to all learn at one speed. For some, this is too quickly, while for others it is not fast enough. In either case, learners are frustrated and are at risk of leaving the program. The authors have found that these individual learning systems reduce learner frustration, increase the efficiency and speed of learning, increase instructor efficiency, increase training transfer, and reduce learner attrition. The final and perhaps most important benefit is that individual learning environments develop self-directed behavior by placing the onus for learning on the individual. Instead of sitting in a classroom and receiving information, the learner is responsible for selecting the skills they want to learn, working through the materials provided, and practicing the skills. The need to be a self-directed problem solver is required as soon as training begins. Learners make their own decisions regarding the nature of their learning experiences, how they will learn, the evaluation they will place on their progress, and the areas in which they must overcome skill deficits. The learner also gains extensive experience in a method of learning that is quite like the method by which successful people in industry continue to learn and develop, namely the skill-oriented approach. Additionally, learning activities are problem-solving situations in which the learner brings to bear whatever resources can be obtained in the form of information, instructional assistance, or meaningful experiences. The authors have found that this is a more effective way to develop self-direction or responsibility in workers. This sets an expectation that someone within the organization is required to be responsible for their actions, increases the likelihood they take initiative on the job, think critically when faced with challenges, and can plan their future learning.

To ensure that learners succeed within a more individual system, it is critical that clear expectations are set, and an explicit evaluation system is in place (Adams, Hogan, & Steinke, 2018b). If the analysis phase is done effectively, much of the evaluation work can be simple to implement. Since the analysis phase has identified what someone needs to do, when it is needed, and the level required to be successful, this can be shared with learners. When someone comes into an organization and has clear expectations for success, it helps the evaluation process. Using the same rating scale used to determine the level of skill in the analysis phase to evaluate learning, much of the pressure to make learning information-oriented is removed. The learning system is not geared to teach specific information; therefore, there is no need to evaluate the degree to which it has been absorbed by the trainee. The system is geared to the achievement of behavioral goals, and the evaluation focus is on the degree of success in achieving these goals. There is no need to develop or rely on a traditional test or knowledge-based assessments. Learners progress through the training by demonstrating their skill level to the instructor or other identified expert in the skill. In doing so, instructors and program directors can easily identify skills where learners tend to struggle to refine program learning materials. This form of evaluation also holds instructors and direct supervisors accountable when evaluating on the job skill performance. Instructors are less likely to artificially inflate a learner's performance ratings if they know the same ratings will be used to evaluate the employee's performance on the job.

Conclusion

Successful vocational training and apprenticeship programs across the global require instructional design that is successful in overcoming the multiple challenges that have led to less-than-optimal results. Programs need to determine what must be produced and how to show what is produced through a form of training analysis. This analysis phase should ideally identify the competencies and skills performed on the job, when these skills are needed, and determine the level of skill required based on a valid and reliable rating scale. Further, the analysis should provide a clear guideline for effective performance assessment, verification of training content, and the opportunity for individualized/personalized training. When produced using sound principles of analysis and by following the systematic procedures for an individual, self-directed learning environment, training programs have shown to be valid and useful for occupational performance (Adams, Hogan, & Steinke, 2017). As the demand for apprenticeship programs and skilled workers grow, it is critical for TVET programs build learning environments that meet the needs of both the learners and employers. In order to meet these micro-credentialing and adult learner needs, as well as addressing the challenges of a changing workforce, it is critical for program directors and designers to implement systematic approaches designed to overcome challenges.

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TECHNICAL VOCATIONAL EDUCATION AND TRAINING (TVET): A VIABLE STRATEGY FOR POVERTY ALLEVIATION IN NIGERIA

B.J. Ekhalia, W. B Kareem, H. O. Abubakar, J. Onuh, and O. A Ekele

ABSTRACT

Technical Vocational Education and Training (TVET) faces enormous demands globally because of the abnormal state of joblessness and the quest for technological advancement, industrialization, and economic development. TVET has indisputable impacts on national development which is understood as associated with a range of socio-economic imperatives that include challenges of poverty and unemployment. Despite the abundance of natural resources, poverty remains prevalent in Nigeria. For TVET to achieve its objectives of enabling learners to catch up with the ever-changing living standard in a fast-growing technological world and creating jobs for sustainable living, it must be strengthened through global partnerships because no government can singlehandedly shoulder this enormous responsibility. It is with this understanding that this paper seeks to examine the need for global partnerships in TVET, roles of TVET in the global economy, the necessity for global partnerships in a national economy, the effects of youth unemployment on national development, and TVET as a viable strategy for poverty alleviation in Nigeria. The paper recommends that global partnerships should be encouraged. Sharing of ideas in terms of policies, strategies, curriculum, and implementation between global TVET institutions, industries, and stakeholders—aimed at ensuring that learners are abreast with developments in the world of work – should be implemented.

Keywords: *Alleviation, Education, Technical, Training, Vocational & Poverty.*

Introduction

Technical and Vocational Education and Training (TVET) is any education, training, and learning activity leading to the acquisition of knowledge, understanding, and skills that are relevant for employment or self-employment. TVET serves here as an overarching term to describe all kinds of formal, non-formal, and informal training and learning provided by different institutions at various learning locations. TVET is concerned with the acquisition of knowledge and skills for the world of work. In the past various terms have been used to describe elements of the field that are now conceived as comprising TVET. The Second International Congress on Technical and Vocational Education held in Seoul in 1999 decided that the best, most comprehensive term to use is Technical and Vocational Education and Training (TVET) (Hollander & Mar, 2009).

TVET is known by many other names in different countries and regions. Among the names are Apprenticeship Training, Vocational Education, Technical Education, Technical-Vocational Education (TVE), occupational Education (OE), Vocational Education and Training (VET), Professional and Vocational Education (PVE), Career and Technical Education (CTE), Workforce Education (WE), and workplace Education (WE). Even though TVET is known by different names the focus is the same.

UNESCO, (2002) defined Technical and vocational education and training (TVET) as those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, acquisition of practical skills and attitudes, and understanding and knowledge related to occupations in various sectors of economic and social life. TVET plays a significant role in providing a highly skilled workforce for the development of many countries. TVET is an instrument of social policy. It assists people in certain social groups such as those in poverty or who lack marketable skills (Basu, 1997) to improve themselves. In fact, TVET can alleviate the socio-economic status of those in poverty. TVET produces human resources that have both soft skills and technical skills, or the work skills required by the new economy. TVET is an indispensable instrument that helps improve the quality of the workforce by improving their mobility, adaptability, and productivity (Caillods, 1994). Thus, TVET can contribute to the enhancement of the competitiveness of any organization in the globalized world.

TVET is well placed to train a skilled and entrepreneurial workforce, required by some countries to create wealth, and emerge from poverty because TVET orients itself towards the world of work with a curriculum that emphasizes the acquisition of employable skills (Afeti, 2006). As TVET is very important in the development of a nation, it must be promoted at both secondary school level and post-secondary school level. TVET should be emphasized in the national human-capital development policy because TVET is the key to both economic growth and to providing individuals economic opportunities. The perception of second-class status presently accorded to TVET should be removed by taking steps such as having an articulation agreement with post-secondary institutions and giving due recognition to TVET qualifications. In view of these facts, TVET can therefore be seen as a viable strategy for poverty alleviation in Nigeria.

Need for Global Partnership in TVET

Technical Vocational Education and Training face huge demands globally due to the high level of unemployment and the quest for technological development, industrialization, and economic growth. For TVET to achieve its objectives of enabling learners to catch up with the ever-changing living standard in a fast-growing technological world and creating jobs for sustainable living, it must be strengthened through global partnerships because governments cannot singlehandedly shoulder this enormous task. The unfortunate historical neglect of TVET is an obstacle to national and global development. Governments globally have sought to address the issue of unemployment. The number of unemployed graduates and youths in the labour market is alarming but more alarming and disturbing is the quality of these graduates. Unemployment has bedeviled the lives of people, causing untold hardship, suffering, dejection, and frustration among other outcomes. Adebayo (2013) believes that the high rate of unemployment among youths has contributed to high rates of poverty and social vices. The need for global partnerships in TVET is also justified by the fact that TVET institutions and their programmes are ineffective and of low quality. TVET faces a lot of challenges in Africa, the greatest of which Oviawe (2018) noted to be inadequate funding by governments. In addition, infrastructures in most schools, including higher education institutions, are dilapidated. Moreover, Oviawe (2018) further noted that there is an adverse learning condition characterized by a paucity of teaching and instructional materials, and the absence of adequate infrastructures in most TVET institutions.

Furthermore, Okeshola (2012) stated that the hygiene and sanitary conditions in most TVET institutions are also critical, and the lack of such infrastructures has been identified as a contributory factor to the poor retention and participation of girls in TVET. There are also the challenges of inadequate classroom blocks, lack of conducive staff offices, inadequate electricity supply, lack of water supply, inadequate workshop spaces, lack of TVET machines and tools, lack of TVET books, lack of consumable materials, and inadequate instructional materials as found by Ayonmike, *et al.*, (2015).

Research evidence indicates the following as challenges facing TVET:

- most formal TVET institutions are currently operating in an environment that is characterized by low-quality training and mismatch between training and labour market skill demand (Yusuf & Soyemi, 2012).
- the quality of TVET facilities like workshops, books, classrooms, learning environment, machines, computer rooms, TV/Audiovisual, instructors, and contents of curriculum is inadequate in most tertiary institutions (Akhuemonkhan *et al.*, 2013).
- inadequate classroom blocks, lack of conducive staff offices, inadequate electricity supply, lack of water supply, inadequate workshop spaces, lack of TVET machines and tools, lack of TVET books, lack of consumable materials, and inadequate instructional materials (Ayonmike *et al.*, 2015).

The obvious implication of these challenges is that the quality of training given to the learners is very low and they may end up not acquiring adequate skills required for getting and sustaining employment in the labour market or being self-reliant. In view of these issues global partnerships have become necessary for the following reasons:

- The widening infrastructure gap, increased demand for TVET,
- inadequate government funding,
- inadequate facilities and falling standard of education.

It is on these facts that Okoye and Chijioke (2013) opined that global partnerships are inevitable due to the growing economic and financial difficulties which have made it impossible for many governments to pay for the rather high cost of TVET.

Role of TVET in Global Economy

No economy can succeed without a highly skilled workforce that is able to respond with creativity to sudden economic changes, centered on developing and utilizing knowledge (Basu, 1997). The development of a knowledge-based economy coupled with emerging technologies and globalization have influenced future growth trends particularly in the worldwide demand for skills and expertise. Therefore, Mouzakitis (2010) believes that any nation that aims to compete in the world arena must have a workforce that can adapt and adjust to the changing demands arising from technological advances in the knowledge-based economy. Traditionally, vocational education has been identified with educational provision directed at occupational learning of types of work that are seen as requiring only lower-level skills, commonly 'manual' rather than intellectual skills, and which consequently may be taught, through focused 'training' rather than through a more expansive engagement in 'education' (Moodie, 2002).

However, with recent developments, the orientation of TVET has changed. TVET does not engage itself entirely with the preparation of the workforce for low-level jobs. Now TVET is recognized as one of the most important keys to sustainable development. In fact, TVET enhances human capital development for industrialization. It is through programs like TVET that a country can produce the highly skilled workers needed to propel economic growth. TVET has been getting attention from the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Bank, and many bilateral aid agencies since the year 2000, due to the important roles played by TVET in the development of a nation. According to Basu (1997), TVET helps develop the economy of a country by providing skilled workers for the labor market. In addition, TVET is an instrument of social policy. It assists people in particular social groups, such as those in poverty or who lack marketable skills, to improve themselves (Basu, 1997). To achieve all these aspirations, especially in a changing economy, a country needs a strong TVET system, and this has been shown to be true in some countries, as described by Segerstrom (1998). According to these authors, strong economies, such as Germany, Japan, South Korea, and Singapore all possess well-developed vocational and technical education (VTE) systems. Human resource development is an investment that cannot be taken lightly, otherwise, the country may not be able to compete in the globalized world. In fact, according to

Park (2009), human resource development through TVET is a cycle of investment in human resources to enhance productive capabilities.

The utilization of those resources to produce higher output, and the consumption by those human resources of the benefits arising from the increased output, leads to an enhanced quality of life. A good human resource development policy must emphasize the development of highly skilled workers, and this can only be done through a good TVET system. There is no doubt about the fact that the nature of occupations served by the vocational education sector has been evolving progressively in recent decades into one demanding more intellectual and higher-order skills commonly associated with traditional professions. The increase of business, communications, and service industries, and the evolution of economies into knowledge-based societies have contributed to the transformation of vocational education, especially in the more economically developed countries, into a sector more focused on education than on training (Hyland, 2002). With the changes occurring in the workplace and work environment, a well-educated and highly skilled workforce is needed to achieve success and prosperity. There is a need for highly skilled workers all over the world and through TVET individuals have the chance to acquire a combination of knowledge, practical and social skills, positive attitudes, and the ability to think creatively and responsibly as well as to act independently. This is achievable because Remington (2018) noted that TVET curriculum combines both theoretical (30%) and practical components (70%).

Necessity of Global Partnership in a National Economy

Globalization and the intensive use of information and communication technology have led to the emergence of a new economy (Boutin *et al.*, 2009). A division of economic and social affairs of the United Nations (2001) defines globalization as a flow, between countries of goods, services, capital, ideas, information, and people, which produces national cross-border integration of several economic, social, and cultural activities. The use of information communication technology (ICT) has made possible the internationalization of core economic activities such as the exportation of some goods and service sectors from one country to another where labor is cheap or business transactions without the merchant and customers being present at the same place. For example, the USA has outsourced many businesses in the areas of electronics and technology as well as pharmaceuticals to countries like India which has a large pool of skilled workers and as a result, both countries enjoy mutual benefits which in turn boost the economy of an individual nation.

Effects of Unemployment on National Development

Nigeria as a nation has experienced several forms of economic, political, and social unrest. In recent times, unemployment which is caused by individuals and government forces had joined the list of the social evils experienced in Nigeria today. The issue of unemployment has become a worldwide phenomenon demanding increased attention, though the impact is more

devastating in developing nations (Walterskirchen, 2003). According to the National Bureau of Statistics (2012), Nigeria's rate of unemployment stood at 19.7%. In fact, Adebayo and Ogunrinola, (2006); George and Oseni (2012), and Ede *et al.* (2013), identified unemployment as one of the major challenges confronting Nigeria's economic development. The menace of unemployment in Nigeria both now and in the recent past has been an issue of great concern to economists, policymakers, economic managers, individuals, governments, and many others (Bello, 2003). Unemployment has been defined as a situation where people who are willing and capable of working are unable to find suitable paid employment (Fajana, 2000). The same writer went further to say that the higher the rate of unemployment in an economy, the higher the level of poverty and associated welfare challenges. The effect of unemployment in Nigeria is very severe and threatening to the citizenry and the economy (Bello 2003). The following have been identified to be unemployment effects on the economy:

- a. **Unproductive labour force:** According to Njoku and Ihugba (2011), the most direct impact on the economy of an unproductive labour force is lost output in terms of goods and services. This results in no income tax being collected and reduced income from indirect taxes. Most youths who have the requisite skills in entrepreneurship, those coming from institutions of higher learning with wonderful results, have no place in the work environment of Nigeria. This ugly scenario has made the labour force unproductive.
- b. **Contributes to crime and violence:** With the growth of youth unemployment, the gap between the rich and the poor keeps growing, resulting in social tensions which could affect the entire community, state country.
- c. **Contributes to low GDP:** Njoku and Ihugba (2011) established that the economic size of the workforce directly impacts a country's GDP. Not only does the workforce produce manufactured goods or services or agricultural produce in direct proportion, but also brings in its wake increasing purchasing power. In turn, this fuels economic growth. Thus, unemployment contributes to a reduction in the potential which exists in spurring a country's GDP (Njoku and Ihugba, 2011).
- d. **Political instability:** When unemployment grows in a community, dissatisfaction with the incumbent Government follows. This in turn leads to frequent changes in governments or formations of unsteady coalitions.

TVET as a viable strategy for poverty alleviation in Nigeria

Given the high level of unemployment in Nigeria, the development of entrepreneurial skills and initiatives should be of paramount importance especially in the higher education sector to facilitate employability of graduates who will increasingly be called upon to be not only job seekers but above all to be job creators in Nigeria (Okebukola, 2001).

Nigeria is at its lowest ebb in human capital development and utilization in the view of Okezie (2020) because of its inadequate educational system which tends to produce more graduates

who lack job skills for employment than the economy requires to remain vibrant. Many people are living in poverty and face huge challenges in accessing the skills needed for healthy and productive lives. The development of skills through TVET is now one of the most often-cited priorities by ministers of education in both developing and developed countries (Tang, 2012). In view of this, there is a need to restructure the educational system.

According to UNESCO, (2013), “one of the main reasons for high youth unemployment across the world is a growing mismatch between supply and demand for skills, which disproportionately affects young people in developing countries”. Hence, TVET is widely recognized as a viable strategy for poverty alleviation in Nigeria. This is because TVET plays a significant role in providing a highly skilled workforce for the development of many countries.

TVET is an instrument of social policy. It assists people in certain social groups such as those in poverty or who lack marketable skills to improve themselves (Basu, 1997). In fact, TVET can alleviate the socio-economic status of those in poverty. TVET produces human resources that have both soft skills and technical skills, or the work skills required by the new economy. TVET is an indispensable instrument that helps improve the quality of the workforce by improving their mobility, adaptability, and productivity.

Conclusion

Technical and vocational education is an important component of the education system. It is undeniable that TVET plays a great role in the economic development of a nation. TVET helps students prepare for occupational fields through the acquisition of broad knowledge and generic skills applicable to a wide variety of occupations. TVET, through its orientation toward the world of work and the acquisition of skills, plays an essential role in promoting a country’s economic growth and poverty reduction thus ensuring the social and economic inclusion of marginalized communities. TVET helps learners acquire the skills, knowledge, and attitudes needed to develop professional careers and enter the world of work as well as active citizenship and lifelong learning. The implementation of TVET should be the responsibility of not only the government but also the business and industry sectors.

Recommendation

Based on the facts from the literature evidence reviewed, the following recommendations are made:

- i. Global partnerships between the public, government, industries, and institutions in terms of sharing of ideas, policies, and strategies should be encouraged.
- ii. There should be synergy between global TVET institutions, industries, and stakeholders aimed at ensuring that learners are abreast of developments in the world of work.

- iii. TVET programme should be re-emphasized and promoted to attract more youths to enroll in these programmes.
- iv. Efforts should be made to ensure that TVET is not viewed as a second choice in education options.

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SUSTAINABLE PARTNERSHIP IN TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING IN A SECURED ENVIRONMENT IN DEVELOPING COUNTRIES OF AFRICA

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ABSTRACT

Fundamental issues of hunger and unemployment have bedeviled many countries of the world, particularly developing countries of Africa. Governments have tried to curb the menace, but the trend has persisted. A vital way to deal with this is through the engagement of technical and vocational education and training (TVET). Defined as a type of education that equips individuals with skills and knowledge for useful living, TVET is viewed as a panacea to hunger and unemployment. However, for most developing countries of Africa, governments have been unable to provide TVET to citizens to equip them for functional living. It has therefore become necessary to partner TVET with the private sector. The public-private partnership (PPP) is discussed in this paper, with models developed and in use by certain technologically developed countries of the world. Sustainable development can be achieved through the PPP strategy employed in TVET. For TVET to thrive, however, the TVET environment must be made safe, secure, and conducive. Security problems arising from the activities of bandits, herdsmen, insurgents, and kidnappers seriously jeopardize TVET's chances of thriving and meeting the needs of citizens. Therefore, all hands must be on deck to deal with this social malaise for better partnership in TVET development.

Keywords: *Hunger, Public-private partnership (PPP), Sustainable Development, Technical and vocational education and training (TVET), Unemployment*

Introduction

One fundamental problem bedeviling countries of the world, especially developing countries of Africa, relates to curbing hunger, disease, and unemployment to make life better for citizens. A key answer to this problem lies in taking a closer look at the type of education that has the capacity to guarantee such a life. It is, therefore, important that technical and vocational education, viewed as education for useful living, be conscientiously considered. In this paper, the term technical and vocational education and training is defined, and its objectives outlined. The paper looks at TVET as operating side by side with sustainable development. The paper x-rays the current TVET environment and brings to the fore the challenges and threats to effective TVET practice for many developing countries. To achieve sustainable development, the paper argues that partnership between the public and private sector is necessary, especially since governments of those countries have failed to adequately address the needs of citizens through TVET. The paper examines what has now come to be known as Public-Private Partnership (PPP) in TVET development, taking a further look at PPP's global models. The paper concludes that for developing countries of Africa to make a substantial stride in empowering their citizens, PPP in TEVT development must be embraced with all vigor. This way, problems of hunger, disease, and unemployment will be drastically reduced.

Technical and Vocational Education and Training

The term “technical and vocational education, TVET” has had a lot of space in the literature devoted to it. It is the concept that has preoccupied governments and the private sector of developing countries the world over. This is especially true since the world has experienced various tumults that have led to rising levels of unemployment and hunger, culminating in social vices.

TVET has come to be associated with training for knowledge and skills acquisition for functional work life. It is the type of education which, according to Okoye and Okwelle (2013), can be regarded as one that places emphasis on the 3Hs – the head (knowledge), the hand (dexterity), and the heart (consciousness). In other words, TVET is the type of education that provides knowledge and skills to individuals which makes them conscious as to contribute to nation-building, besides enhancing the quality of life of those individuals through self-engagement and self-profit making. UNESCO and ILO (2002) define TVET as “those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding, and knowledge relating to occupations in various sectors of economic and social life.” Simply put, TEVT is that type of education that combines general education with scientific knowledge in the study of technologies which leads to the acquisition of skills and knowledge in occupations for functional work life.

Paying a closer look at the definition of TVET shows that it possesses certain characteristics as enumerated by Ansah and Ernest (2013), as follows:

1. It deals with skills acquisition for wage employment and greater self-employment for private sector development;
2. It has been identified as the prime mover for socio-economic and industrial development;
3. It is directed towards employment-oriented competency and capacity with opportunities for further training and education; and
4. It is linked with industry.

The above features of TVET clearly make it stand out if adequate attention is given to it. Unfortunately for most developing countries, this attention is lacking. Many developing countries prefer to place a high premium not even on general education but on other sectors. In any case, however, citizens of a nation need to be educated to acquire skills that can make them functionally engaged and self-reliant.

According to the Nigerian National Policy in Education (Federal Republic of Nigeria FRN, 2014), TVET has the following broad objectives:

1. To provide trained manpower in applied sciences, technologies, and business, particularly at craft, advanced and technological levels;
2. To provide the technical knowledge and the vocational skills necessary for agricultural, commercial, and economic development; and
3. To give training and impart the necessary skills to individuals who shall be self-reliant economically.

Buttressing the aims of TVET, Ansah and Ernest (2013) held that this type of education is aimed at equipping “young men and women with the technical and professional skills needed for socio-economic development,” stressing that it lays emphasis on training for self-employment. In effect, TVET is a panacea for the problems of hunger and unemployment, especially in most developing countries. The growing youth population in most countries of the world are unemployed, leading to an increase in social vices, such as cultism, Boko Haram insurgency, herdsmen attacks, kidnapping, and armed robbery, prostitution, drug abuse, banditry, and political thuggery (Manabete et al., 2019). As a type of education, TVET is brought in, as Egekun in Badung (2007) explained, to prepare “the individual learner to earn a living (to be self-reliant) or increase his earnings in an occupation where technical information and the laws of science and technology...” are at work.

TVET and Sustainable Development

Development is a term that has come to be closely related to sustainability. Development, according to Strange and Bayley (2008) means “the act or process of developing growth,

process.” The authors argued that social, economic, and environmental growth are inextricably linked and must all be viewed together. Development in this paper means growth. It means progress and positive change. This implies that where there is no growth or progress, development has not taken place. With respect to TVET, when progress or growth has been recorded in TVET strides and citizens are functionally engaged, it means development has taken place. This development will be seen in an increase in infrastructure, facilities, and other social amenities.

Lele (1991) argued that the concept of sustainable development came to the front burner in the 1980s. Over the last couple of decades, the concept has assumed diverse connotations. According to Lele, the term has come to be interpreted as “sustained growth”, “sustained change”, or “successful development”. Strange and Bailey (2008) saw sustainable development as the “development that meets the needs of the present without compromising the ability of future generations to meet their needs.” In any case, sustainable development can be loosely used to refer to development that is characterized by sustainability. In other words, where development or growth has occurred, that effort needs to be sustained. The term “sustainability” entails viably keeping up the growth or development or change that has occurred. What this entails for TVET is that where progress or growth or development has been achieved, that effort needs to be maintained. All this is achievable only when there is a concerted effort by all stakeholders. TVET policies and programs aimed at enhancing the wellbeing of beneficiaries must be pursued with vigor until progress or development is achieved. That progress or development must be sustained.

The United Nations Environment Programme (UNEP) concept of sustainable development encompasses helping the poor, self-reliant development, cost-effective development using nontraditional economic criteria and health control, food self-reliance, clean water, and shelter, among others (Lele, 1991). In this connection, sustainable development has the following objectives, among others: reviving growth, changing the quality growth, meeting essential needs of jobs, food, water, and sanitation, and conserving and enhancing the resource base (World Commission of Environment and Development, WCED, 1987). Munn (1988) summarized sustainable goals as the integration of conservation and development; satisfaction of basic human needs; achievement of equity and social justice; provision of social self-determination and cultural diversity, among others. In this connection, sustainable development has challenges. For instance, the World Economic and Social Survey (2013) discovered that sustainable development faces challenges in all three dimensions of sustainable development - economic, social, and environmental. These challenges deal with sustainable cities, food and nutrition, security, and energy transformation. The United Nations Conference on Sustainable Development held in Rio Janeiro, Brazil, from 20-22 June 2012, gave a wide range of interconnected challenges of sustainable development, including decent jobs, water, oceans, food security, and disaster readiness.

X-Raying the TVET Environment: Security Challenges and Other Threats

TVET in most developing countries has faced several threats and challenges. One such challenge is related to peace and security. The term peace, according to Igbuzor (2011) means “the absence of war, fear, conflict, anxiety, suffering, and violence.” It is the process that involves activity linked with increasing development in a direct or indirect manner and reducing conflict in societies and on a global level. Consequently, Abbas (2018) saw peace as “the absence of war, the presence of justice, equality, and development; the existence of the rule of law, respect for human life and dignity and tolerance among and between people...” In many developing countries of Africa, peace is eroded as injustice, intolerance, inequality, disrespect for the rule of law, and for human life have thrived, leading to tensions and violence. Violence is a condition where one party perceives that its need, goals, aspirations, desires, and expectations have been discredited and trampled upon by another party. Buttressing this, the UN General Assembly (2015) explained that the propellers of violence among countries and societies are lack of socio-economic opportunities, high rate of youth unemployment, extreme poverty, gross inequality, political marginality, and marginalization in governance, economy culture, and religion. This undoubtedly is the bane of most developing countries of Africa where despotic leaders exercise power with clear absolutism, in many cases, with ethnic, religious, or regional skewing.

Suffice it to say that there is no activity, either private or public that can thrive in an atmosphere of insecurity. The same thing is true of TVET. According to Wahba (n.d.), for TVET to achieve its objectives, the TVET environment must be made more secure and friendly with more effort devoted to funding and adopting a positive attitude to training and management. In this connection, there is no gainsaying the fact that many countries of the world are plagued by one disturbing uprising mostly in the form of violence or the other. In a great majority of cases, most of the violence that has created security challenges is based on factors such as religion, ethnicity, and politics (UNDP, 2016). The Arab Spring that began in North Africa a decade ago has spread to other Arab countries and is continuing in countries like Yemen, Afghanistan, Tunisia, Iraq, and Turkey in the Middle East. Since the ouster of Gaddafi and his subsequent murder, Libya has experienced various stages of uprising. The Sahel Region of Africa is plagued by insurgency that is a decade old. Consequently, rating how dangerous certain regions of the world have become, the Global Terrorism Index (2015) rating showed that 78% of the lives lost to terrorism occurred in countries like Iraq, Nigeria, Afghanistan, Pakistan, and Syria. The Boko Haram insurgency has devastated countries like Nigeria, Niger, Chad, and Cameroon. Since 2009, more than 20,000 citizens have been killed in Nigeria, this aside from other security challenges like cattle rustling, armed robbery, armed banditry, political thuggery, and kidnapping, coupled with apparent political issues like religious domination, farmers/herders' clashes, minority/majority grievances, and political power tussle (Abbas, 2018). In South Africa, there have been increases in xenophobic attacks in recent times. In Zimbabwe and Sudan, there have been public outcries against those governments. Al Shabab has intensified its activities in Somalia and Kenya. In Europe, Venezuela experienced its worst uprising. At the

moment, there are demonstrations in Hong Kong and Myanmar against the government. All these instances constitute a serious security challenge for TVET.

Another challenge to TVET is poor enrolment. Research evidence shows that TVET institutions have poor training (operating environment) leading to poorly trained individuals (Yusuf et al., 2012), poor TVET facilities (Akhuemenkhan et al., 2013; Ezugu, 2000), and inadequate library and infrastructural facilities (Ayonmike et al., 2013). This should constitute a challenge to governments, especially of developing countries. Such governments will be required to take steps to address this challenge.

One fundamental factor which appears to be responsible for the poor enrolment in TVET programs deals with the fact that this type of education is perceived as belonging to the intellectually weak segment of the population. Bo (2012) pointed out that even in China, TVET is regarded as belonging to a sub-class or lower rank education. Overall, as Oviawe (2018) argued, the “long proportion of students enrolled in TVET programs signals stagnation and overall poor public training capacity,” stressing that “TVET has failed to absorb many school leavers who would have had opportunities to make useful contributions to the development of the society.”

Achieving Sustainable Development Through the Private Sector

According to Oviawe (2018), the private sector “is that part of a country’s economic system that is run by individuals and companies, rather than the government,” adding that the main goal of the private sector is profit-making. Simply put, the private sector refers to those organizations that are not run and operated by the government. In the context of this paper and for most developing countries of Africa, the private sector is taken to include the community, town hall and tribal societies, the rich, Parent-Teacher Association (PTA), non-governmental organizations, the industrial sector, international donor agencies, professional associations, old boys’ associations, and well-meaning individuals with a passion for the growth and development of TVET. In Nigeria, for instance, these categories of people and organizations have made immense contributions to TVET in the form of donations of funds and technical equipment, construction of TVET buildings (e.g., ICT Centre), purchase of TVET facilities, and training of personnel. On the other hand, the public sector is made up of agencies and institutions of government, owned and operated by the latter (Oviawe, 2018). The author stressed that in many cases the public sector does not aim at profit-making but the delivery of services to citizens.

Globally, however, governments have not been able to effectively provide the services to citizens despite huge budgetary allocations. TVET which aims at providing functional skills and knowledge to citizens has remained a capital-intensive enterprise. Even in the funding of general education, the challenge has been enormous (Diraso et al., 2012; Diraso et al., 2009; Manabete et al., 2009). Since governments, especially in countries of Africa, have not been able to effectively provide essential services to citizens, hunger and poverty have increased considerably, occasioned mainly by illiteracy and unemployment (Manabete et al., 2019).

Consequently, most of these countries have a weak TVET system, hence the need for private-public-partnership or what can be described as community participation in TVET.

Why and Areas of the Partnership?

If governments, especially in developing countries, have not been able to adequately fund education in general and TEVT, the specific question can be advanced as to why it has become necessary to form partnerships. Popoola in UNESCO (1996) gave some of the reasons that included assisting educational institutions turning out higher quality graduates to the overall benefit of the world of work, better equipping of vocational education graduates with relevant skills, and helping to positively influence curriculum design and development. Others are improving the quality of instruction through interaction with teachers of technical institutions, enriching instruction by the participation of experienced professionals, and rendering support services such as maintenance and provision of equipment and machinery for training purposes.

The status of cooperation between industries (the private sector) and the government remains bleak. According to Popoola in UNESCO (1996), cooperation between the private sector and government in Nigeria has been weak, occasioned mainly by lack of knowledge and appreciation of the enormous, long-term benefit of such cooperation to enterprise and national economy, and economic hostile operating climate which tends to promote “short-termism” and expense of long-term sustainable growth.

In Uganda, Lugujjo and Manyindo in UNESCO (1996) reported that major constraints to TVET partnership occur in the following areas: No coherent political framework created by political institutions; there was inadequate financing by enterprises available as well as continuing information gap between enterprises and training institutions. As a case in point, the pilot project on cooperation by Lugujjo and Manyindo showed that the existing linkages between training institutions and industries were weak and largely occurred through students’ industrial training, due partly to 1) inadequate industrial training places for all students; 2) weak interaction between industrial training officers in technical institutes and their counterparts in industries; 3) absence of vetted industrial training program; 4) absence of clearly articulated joint projects; 5) negative attitude to industrial training by industries as they still hold on to a short-term commercial focus.

There are vital areas where the partnership between the private sector and educational institutions of government can take place. When concerted effort is put in by both stakeholders, these areas can yield appreciable results. Popoola in UNESCO (1996) listed some of the areas of partnership as follows:

1. Attachment of technical education students to enterprises for practical work experiences.
2. Provision of special equipment/machinery to technical education at agreed period for the training purposes.
3. Interaction between teachers and relevant company officers to draw up result-

oriented attachment programs and to jointly and closely monitor the implementation of same for the maximum benefit of students.

4. Review both parties of relevance/appropriateness of curricula drawn up for vocational students considering realities and challenges facing enterprises.

Public-Private Partnership in TVET Development (PPP)

From the outset, the term partnership is a vital concept in any successful enterprise. The term simply implies that cooperation is needed to successfully carry out an undertaking. It is a concept which, according to Chukwu and Omeje (2019), “connotes a two-way lending of variant supports by two or more bodies towards achieving most times a mutually benefitting goal.” It is concerned with seeking out relationships with other organizations, groups, or sectors because there are scarce resources and competencies (Jackson, 2009). As regards TVET, Chukwu and Omeje viewed partnerships as the “collaborative effort of TVET institutions and industries to provide best practices to TVET students in order to produce marketable and demand-driven workforce.”

A vital partnership package that enhances TVET globally is what has come to be known as a public-private partnership (PPP). PPP, according to the PPP Policy (2017), is a “long term procurement contract between the public and private sectors in which the proficiency of each party is focused on the designing, financing, building and operating an infrastructure, project or providing services with the appropriate sharing of resources, risks, and rewards.” The concept has been defined by Maigida (2014) as a joint mutual agreement that has been entered into by the government and private organizations for the purpose of providing services to citizens based on agreed terms. The World Bank Institute in Edokpolor and Imafidon (2017) defined PPP as “a long-term contract between a private party and government agency, for providing a public service, in which the private party bears significant risk and management responsibility.” It is a “cooperation between public-private actors in which they jointly develop products and services and share risks, costs, and resources which are connected with these products and services,” (van Ham & Kopperjan in Hodge et. al, 2005).

As touching TVET, PPP refers to a project agreement in which agencies of government and government enter partnership with private bodies for the purpose of delivering on TVET goals as related to training, funding, and infrastructural provision. Consequently, the PPP Policy (2017) outlines the following characteristics:

1. Involve an arrangement with a private sector entity by delegating one or more project functions to design, build or expand/develop, operate, maintain, rehabilitate, or finance an asset or service.
2. Require a private party to take significant risk in the performance of functions delegated, that is the private party’s revenue is dependent on its performance (the availability of an asset, or the quantity and quality of outputs supplied).
3. Involve public infrastructure or service provided for public benefit where the output

has the element of facilities/services being provided by the government as a sovereign to its people.

4. Operations or management of asset or service is within a specified period. The agreement with the private sector entity has the element of a time after which the arrangement comes to a closure. Hence the arrangement is not in perpetuity.

Several advantages accrue to PPP in TVET. The African Development Fund (ADF, 2006) identified poverty reduction, improved access to quality TVET, enhanced employment, increased funding, and reduction in out-of-school youth as some of the advantages.

Models of PPP in TVET Development

Viewing the need to establish clear strategies for effective public-private partnership in TVET, models have been developed which serve as guides for other TVET development endeavors. These models are briefly presented in this section. The idea is to challenge and spur greater effort towards better perspective and development of TVET practices.

The Singaporean Factory School (HRD) Model

Known as the Human Resource Development (HRD), this model engages the Singaporean government to train its workforce to “truly state-of-the-art standards”, engaging the industry as a key partner in training (Oviawe, 2018). In essence, students are trained in an environment characteristic of the environment of operation in industry after graduation. In other words, the school where students train is more of a factory in which they will work after graduation. Countries like South Korea and Malaysia have successfully utilized the Singaporean factory school model.

At the core of the HRD model are taxation policies that allow the government to collect relevant revenues from firms (usually set at some percentage for the firm’s labor costs) and then allow the firms to make use of the revenues collected to undertake training within their own companies. This model has been found to be successful in achieving its objectives (Johnson & Adam, 2004), especially in areas of small and medium scale enterprises.

Perhaps what appears to be close to the HRD model for a developing country like Nigeria is the Tertiary Education Trust Fund (TETFund) and Petroleum Technology Development Fund (PTDF) interventions where government policy allows for the agencies to collect development levies from industries to undertake not only staff training and development but also to sponsor research and development and provide infrastructure and training facilities, especially in tertiary institutions. Initially, the Decree 7 of 1993 named the Fund ETF with the following mandate: to “use funding and project management from the 2% education tax charged on an assessable corporate profit of all registered companies in Nigeria to supplement budgetary allocations at all levels of education (Bogoro, 2019). According to Bogoro, by 2011, the Fund was renamed

Tertiary Education Trust Fund (TETFund) through the TETFund Act with a mandate to restore, rehabilitate and consolidate tertiary education in Nigeria from a 2% annual tax on assessable profits of all registered companies in Nigeria. Similarly, the core mandate of PTDF is the development of the capacity, capability, and competencies of Nigerians for them to play effective roles in the operational and management segments of Nigeria's oil and gas industry. This mandate is achieved through Human Capital Development such as education and training programs, institutions and systems development, promotion of research and acquisition of relevant technologies, and manufacturing and materials development (Egbobah, 2011).

The Dual Vocational Training System

This model was developed by Germany and exists in other countries like Australia, Denmark, and Norway. The dual model is based on a law that dates back to 1969. This law mandates a governance structure for TVET. The model allows for delegation of responsibility for curriculum and assessment to a coalition of labor representatives, businesses, and educators. Business associations, as explained by Rauner (1998) and Gill and Dar (2000) undertake complex roles trying to manage the model by monitoring the quality of training firms provide in the dual system.

In the German model, TVET is organized by both the private and public sectors and conducted in companies and part-time vocational schools. In other words, the dual TVET model undertakes training at the workplace, but trainees must also attend vocational schools. In practice, 1-2 days of training is undertaken in public schools; and 3-4 days of training is undertaken in companies. While government regulates the way the dual model is undertaken, firms and schools undertake the function of supervision (Dybowski, 2005; Market Intelligence Germany, 2014; Oviawe, 2018). The German model, according to Hawley (n.d.), insists on the following things being in place: a legislative framework that requires firms to invest in training of newly hired workers, a funding mechanism through a combination of federal regional and business spending; the capacity to carry out job analysis and curriculum development; local institutions that represent the interests of business and trained professional instructors and administrators. Hawley argued that the German model has been difficult to replicate internationally, although countries like Thailand and Korea have tried to put in place a small number of dual system places (Gill & Dar, 2000).

The National Board for Technical Education (NBTE) approach, as pointed out by Oviawe (2018), is what looks like the dual system approach in which each technical college has a directorate for training and a directorate for commercial production. Besides this, industrial training through the Supervised Industrial Work Experience Scheme (SIWES), currently undertaken by students of TVET can be recognized where, with increased funding and partnership arrangement between government and the industry, students can alternate between the training institution and the industry, the two activities not widely spaced apart, as in the current practice where students spend a year or two in school and go out on a 3-6 months' industrial attachment.

The Japanese Model

The Japanese model is based on a local relationship that depends on high school staff correctly undertaking an analysis of the skills of potential graduates and the suitability for the academic and vocational needs of employers. The Japanese model is like that of the US which involves vocational schools of very high quality. In both cases, the vocational schools, according to Hawley (n.d.), are built of strong relationships between educators and employers.

TVET in Certain Nations

It would avail perhaps to try to x-ray what effort certain countries, especially developing countries of Africa, have made in their strides to develop TVET. In South Africa, it was reported by Eberlein in UNESCO (1996) that South Africa adopted the National Training Strategy Initiative which begins with a National Qualification Framework (NQF), specifying learning in terms of nationally and internationally accepted outcomes. NQF provides an avenue for meeting the needs of key stakeholders, notably the State, the business labor organizations, and providers of education and training.

In Nigeria, Odugbesan in UNESCO (1996) asserted that TVET in Nigeria outside the university was basically offered at a local apprenticeship with master crafts which trains artisans and craftsmen in vocational schools and at the National Technical Certificate (NTC). At the technical college level, craft level TVET is offered for the National Technical Certificate, and advanced craft level TVET is offered for the Advanced National Technical Certificate (ANTC). Polytechnics and monotechnics offered a National Diploma and Higher Technician/Technologist program leading to the award of Higher National Diploma (HND). Colleges of Education (Technical) offer courses leading to the award of the Nigeria Certificate in Education (Technical) certificate.

Revamping TVET Through PPP

To revamp TVET through PPP, a concerted attitude of will in implementing TVET policies must be done. In addition, TVET must be related to priority areas of a country, and as well linked with traditional skills and training for skills for job creation (Oviawe, 2018). To this effect, the author maintained that the private sector must play a key role, stressing that “the private sector intervention would include training and retraining of staff and students, participation in curriculum development, provision of capital and design and fabrication of various types of tools and equipment. The Organization for Economic Cooperation and Development (OECD, 2013) added that other areas will include internships, apprenticeships, and industrial attachment. Klein in Grunewald (2008) identified the following areas:

1. Identifying training needs, and, in some cases, providers.
2. Setting standards.
3. Developing training programs/syllabi.

4. Developing teaching and learning materials.
5. Qualifying and supplying teachers and instructors.
6. Planning and implementing training measures.
7. Setting up and implementing testing and examination systems.
8. Evaluating the relevance, significance, effectiveness, and efficiency as well as the impact of training measures and related activities.
9. Financing activities.

These methods require commitment from all stakeholders, particularly the government and the private sector. The government, as the formulator of policies and programs, will be required to consider these strategies for revamping TVET through the PPP seriously. Any government which folds its arms without due consideration for the training and retraining of its workforce, provision of adequate funding to TVET, and the planning and implementation of TVET programs, is not likely to succeed at its effort to provide employment to citizens.

Conclusion

Education, functionally given to citizens is expected to lead them not only out of ignorance but also out of hunger and unemployment. The greatest threat to citizens cooperates existence, besides insecurity, is hunger, disease, and unemployment. When a nation's civil population is unemployed, that population's quality of life will be low. Most affected by this trend are the developing countries of Africa. Coupled with bad governance, the civil population of most developing countries lives below the poverty line, in fact in many cases less than one dollar per day.

It has been recognized the world over that one type of education that is able to lead citizens of a country out of poverty and unemployment is technical and vocational education and training (TVET). Defined as that type of education that equips citizens with knowledge and skills that make them functionally engaged and self-reliant, TVET has enabled governments to deal with startling issues revolving around survival. It has enabled citizens to find meaning in life and provided them with a sense of pride both for themselves and their families.

Over the years, governments have been unable to effectively fund TVET, despite huge budgetary allocations to education in some countries. In others, such as Nigeria, budgetary allocation to education has been between 6% and 7%. This makes it difficult for such countries to implement TVET programs towards sustainable development. Sustainable development has been seen to be a positive change or growth that impacts the lives of citizens. In fact, while some countries have made a concerted effort to increase their budgetary allocations to education, many others, for some political reasons, have relegated education to the background, which in many cases, does not even form part of those nations' developmental programs.

Coupled with poor funding and misplacement of priorities by some governments, TVET has been bedeviled by several ills ranging from security to low enrolment. The former has been due mainly to the activities of terrorist organizations, abductions, banditry, and growing disaffection in the polity. For instance, the activities of terrorist organizations such as Boko Haram, ISWAP, and Al Shabab, have created a serious breach of peace and security which has affected education in general and TVET.

One way to functionally support the full realization of the objectives of education is to enter partnership with relevant bodies or organizations. The public-private partnership (PPP) has been stressed in this paper to be essential in supporting TVET and enhancing its growth and development. Certain countries in Asia such as Japan and Singapore, and Germany in Europe, have operated their separate PPP strategies which when implemented in other countries, especially developing countries of Africa, will yield appreciable results. It does not matter, however, for these developing countries to evolve their own PPP strategies which will ultimately develop and enhance TVET. The paper, therefore, makes the following recommendations:

1. Developing countries of Africa must make a concerted effort to deal with the problem of hunger and unemployment. In doing this, TVET must be given a high premium.
2. Budgetary allocation to education in general and TVET must be increased considerably.
3. Governments of developing countries of Africa need to embrace the policy of public-private partnership in TVET development. Such partnership, when pursued with commitment and vigor, has the tendency to complement the government's effort.
4. Global models of PPP in TVET need to be studied with the goal of implementing such models in developing countries.
5. In the pursuit of TVET, less emphasis needs to be placed on the theoretical content, rather more emphasis should be placed on skill development for self-reliant work life.

Any nation that does not plan to provide functional engagement for its population cannot develop even in the least circumstance. Political gimmicks which constitute well-framed policies, but poor implementation strategies must be removed from any national discourse on TVET. A nation can be viewed to be unproductive when its citizens remain unemployed and poverty levels increase by the day. A nation that plans for its citizens along the line of TVET is the nation that succeeds, whose citizens are functionally engaged, contributing their quota to national development. This way, there will be prosperity in the land.

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CONSTRUCTION WORKERS' VIEWS ON HIGH SCHOOL EDUCATION AS A BARRIER TO SUCCESS IN THEIR FIELD

Dr. Douglas J Swanson

ABSTRACT

This study reviews one of the factors that prior studies have failed to consider as barriers to post-secondary success. The study sample for this project was workers from the construction industry. An absence of research on post-secondary education success, from the perspective of workers was found. A study was undertaken to fill that void, producing 175 nationwide responses to an online survey of construction workers. The survey identified how well these workers believe their high school education prepared them for success in their careers, whether high schools are preparing current students better, or worse, and what secondary education systems need to do differently to improve students' success in this industry. The survey included some open-ended questions. Twelve in-depth interviews were conducted following up on key points. A treasure trove of valuable information was produced. Due to the amount of data collected this article is only able to summarize some of the key outcomes of the survey.

Key Words: *Construction Workers, High School Education, Workers' Views on Education, Post-Secondary Education Success*

Introduction

Life is a continuous teacher and humans are life-long learners. It was an early career where this author would eventually become a bridge and highway construction manager that started him learning that workers are rarely ‘asked’ their opinions. They are generally ‘told’ what to do. During a second career that spanned over a quarter of a century working for unions the author continued experiencing how the people who know the most about the job, the people who do the work every day, are the least likely to have their input sought out. Rooted in these lessons learned became a lens through which the author came to view problems, challenges, and questions: How would the people doing the job answer this question? When the question was raised ‘What are the barriers to post-secondary education successes?’ it seemed that the most logical place to begin was to ask those former students, now workers. As a practical matter, a study could not ‘boil the ocean’ and study all forms of jobs, so the construction industry was selected for this study.

First, what is success? Success is not an abstract concept. In 1931, James Truslow coined the term ‘The American Dream’ to describe a land or country where life is better, richer, and fuller for everyone. A belief that upward mobility is possible for everyone, regardless of the growing inequality in the United States and the challenges individuals face. Dreams that workers could achieve a better life for themselves, and generations of loved ones to come, through the fruits of their efforts, regardless of race, class, gender, or zip code of origin. Today, these dreams have become fantasies or figments of imaginations for most Americans (Wise, 2015). For students leaving high school, embarking on their own path to the American Dream—does that include College or University? Trade school or Community College? Getting a job? —students encounter difficult decisions (Pope & Fermin, 2003).

Review of Literature

Initial searches for research that focused directly on how workers evaluated or provided feedback on how well workers believed their secondary education helped to prepare them for success in a post-secondary education workforce produced almost no results. What the searches did produce fell broadly into one of three categories: a) What do education professionals/institutions think workers and the workforce need; b) What do businesses think of workers and/or think of workers’ needs; and c) Workers, are subjects to be studied, not to be talked to or to ask questions of. The literature review of what workers think of their secondary education found existing research to be almost nonexistent. There is a considerable amount of material that shows what has been riling up students and workers increasingly over the past few decades, taking to the streets to protest issues of concerns around decreased access to success (Buchanan, Bui, & Petel, 2020). To understand why so many workers are not able to achieve the desired success we need to analyze what barriers to success may exist for those workers.

Before analyzing what workers think about their success or education, we need to first understand some of the historic influences on work and working in the United States. Sexism, racism, and classism create barriers in the workplace, as well as our society. The

intersectionality of what makes us different has been exploited for years, often pitting worker against worker (Cross, 2017). It is through the interest convergence of workers of all races, religions, sexes, or any other barrier being used to keep workers separated, coming together, and working collaboratively, that will raise the living standards for all workers (Hogan, 2019). Intersectionality is a component of a theory, critical race, that identifies the interlocking of systems of power and its impact on marginalized portions of society (Gillborn, 2015). The term intersectionality was first used by professor Kimberlé Crenshaw in 1989 to describe how individual characteristics such as gender, class, and race, overlap one another intertwining their interests (Coaston, 2019). Intersectionality is one of the two frameworks used in this study about workers.

The History of Working in the United States

The search for free or cheap labor is in this nation's roots. In the 1500's England established houses of corrections to "train the children of the poor to be grouped up in labor and work" (Isenberg, 2016, p. 21). Some early English visionaries saw the new world as one big workhouse existing to build the wealth of the English nobles (Isenberg). While many of the first European settlers had been skilled craftsmen or men of leisure back in England, that did not prepare those first settlers for doing the manual labor needed to grow the food required to survive, leaving them little time to produce the means to create goods to ship back to Europe and create wealth. What this new world needed was low wage or no wage workers (Zinn, 2015).

Europe was still comfortable with its nobility class structure that heavily influenced the new world: a social class structure. At the bottom were men and women of the criminal and poor classes. The roguish highwaymen, Irish rebels, known whores, mean vagrants, and others who had committed crimes against property in England, were all shipped off, ridding England of the dregs of its society while providing inexpensive workers (indentured servants) to the colonies (Isenberg, 2015). These were workers who society really did not care much about (Zinn).

In 1618 the Virginia Company's charter was amended to give those who brought over an indentured servant an additional 50 acres of land to the 100 acres each settler received. This created an incentive to bring more indentured servants (free labor) while growing the owner classes' wealth derived from the abuse of others (Isenberg, 2016). Importing indentured servants from debtors' prisons in Europe worked for a while but in time those bonded servants worked off their debts, becoming free. An economy running on the backs of bonded servants was not a long-term equitable solution for the owner class. The importation of black slaves solved that problem while building out the class structure even further. From the time of the settling of the Nation onward the reliance on free or inexpensive labor such as bond servants, slaves and convict labor, workers were organizing themselves into guilds and unions to lift themselves from the free labor market (Muroid & Chitty, 2018). "While you may be poor-white-trash or even a white indentured servant, but you were better off than the Black worker" (Zinn, 2015).

Later when women fought for the right to vote, business groups openly lobbied against giving them that right, because then they would want to be paid the same as men. Business owners also believed giving women the right to vote would empower them to support legislation restricting or banning the use of child labor (Muroid & Chitty, 2018).

In 1992, public education in the United States started changing in two significant ways. First, charter schools, which now operate in 43 states and the District of Columbia, were created as publicly funded but privately-operated businesses. Every dollar that goes to funding these privately run, generally for-profit, charter schools is taken from public schools (Lafer, 2018). Secondly, in the first quarter of 2019, the United States student loan debt reached \$1.4 trillion dollars. That is more than double what it was (\$0.65 trillion dollars) in 2009. Student loan debt, which now exceeds the 2007 sub-prime debacle amount, is now second only to mortgages debt for United States residents and the age of students taking out loans is going up, resulting in a shorter loan repayment window, higher payments and less retirement saving or opportunity for other spending (Sabi-El-Rayess et al., 2019).

The United States workforce is more stratified and fractured now more than ever (AAUW, 2021). The extreme disproportionate increases in college costs for example has resulted in United States homeowners owning less of their homes today than they did in the 1980's (Johnston, 2005). Early in 1980's for every dollar of home value, there was 70% of equity. Thirty-five years later, home equity has fallen dramatically, while mortgage debt just keeps growing. In most cases, for every dollar of equity couples have in their homes, they have nearly two dollars in debt. This too adds stress to workers, families, and the workforce playing a role in students post-secondary education plans (Johnston, 2005).

The intersectionality that wage workers share, that struggle to make ends meet, is universal. At the center of this struggle lies the question, are students being given the tools needed to be successful? If the tools are provided the barriers can disappear (Isenberg, 2016).

Research Methodology

The research subjects for this study were construction workers in the United States. Workers who have been out of high school for approximately 20 years for example who would have both their experience to draw upon as well as years of experience of seeing the skills new workers entering the workforce possess. The survey was qualitative research that focused on workers out of high school long enough to have tested the skills they brought into the workforce, to have witness and/or experience the changing demands on the workforce as well as having generated insights on what skills future workers will need to be successful. The survey questions asked can be found in Appendix A.

The survey was available nationally. Respondents answered questions regarding whether they believed that workers are being prepared to be successful in the workforce and whether these workers' view of success changed based on the lengths of time the participants have been out of high school.

While the primary focus was workers who have been out of high school for about 20 years data was also collected from workers in other generations as well. Responses were tracked on workers' thoughts on education, skills, and preparations for the workforce to see if they have changed over time. Additional data was collected from participants, including social benchmarks such as gender and race. Lastly, this research asked about the work skills future workers will need for them to be successful in the workforce of the future.

Research Questions

This study set out to answer the following questions:

- Have workers received the education and skills needed to be successful in today's workforce?
- Are high school students being provided the education and skills needed to be successful in the workforce?
- How are those skills changing, and what skills are new workers going to need to be successful?

With a specific research sub-question:

- Have changes to the workforce affected minorities and women similarly?

Research Design

This research used intersectionality and interest convergence as a framework to explore workers' views on how their secondary education prepared them for success, or not. Additionally, this research used an exploratory qualitative multiphase research design method which is a process for collecting and analyzing quantitative data from multiple phases of a study at a point during the research process into a single outcome (Creswell & Creswell, 2018). The reason this study used multiphase research methods is that a single exploratory method alone would not sufficiently have captured the details or trends in evaluating how well workers feel their secondary education prepared them for success in the workplace. The two phases used in combination allowed for a more complete analysis (Creswell & Creswell).

Sampling

The survey was distributed using a method known as 'Snowballing', a process of forwarding the survey to contacts in diverse fields and locations asking them to distribute the survey link to workers meeting the criterion in their networks. This provided a distribution that was blind to the researcher, eliminating the ability to influence the outcomes by controlling who had access to the survey tool. However, it also prevented the researcher from being able to actively engage in driving up responses from specific groups, such as minorities or women.

The survey was in the field for a 30-day period that included Covid-19 related interruptions as well as the Christmas and New Year's holidays. The number of responses, 175, to the survey supports that the snowballing methodology was successful.

Survey responses were excepted from all generations of workers. The survey data was sorted using the following common generational brackets:

- Gen Z, iGen, or Centennials = Born 1996 – TBD
- Millennials or Gen Y = Born 1977 – 1995
- Generation X = Born 1965 – 1976
- Baby Boomers = Born 1946 – 1964
- Traditionalists or Silent Generation = Born 1945 and before

Respondents were not required to answer every question. The lack of responses to some questions would impact some of the survey outcomes. The sample size of some demographics of workers to some questions would not provide enough data for every cross tabulation to produce relevant outcomes.

Data Collection

The study also focused on the skills needed by future workers to be successful when entering this industry. It is in this section that the opinion of the workers who have been in the workforce for two decades is critical since they may well remain in the workforce for another decade or two. This demographic of workers responding has both 'been there' long enough to know what needs to be done, they will also 'be there' long enough to want to ensure that the new hires have what it takes to be successful.

Results and Discussion

Since the survey did not require each respondent to answer all the questions, some questions received more responses than others. For that purpose, the actual number of responses would vary from question to question. Making the survey more broadly available allowed the study to determine if there are any correlation in how respondents perceived their secondary education prepared them for the workforce from within the target area of Missouri vs. outside the target area. This measure was difficult to achieve because the author could not control for the smaller number of responses from some states.

Survey Analysis

The principal charge of the survey was in three parts:

- Determine how well workers in the construction field felt their high school experience prepared them for success in the field of construction;
- determine if new entrants to the construction field, more recent high school graduates, are better or worse prepared for success; and
- determine what, and if, high schools can better prepare students going into the construction field better to be successful.

Then a foundation was established by first asking the study question one. That being how well the survey takers believed their high school experience helped them.

The unfiltered response was overwhelmingly unfavorable. The majority, 78.2%, of the survey responses to this question felt that their high school experience prepared them 'moderately well,' 'slightly well,' or 'not well at all.' There was an option for the survey takers to add comments to further explain their responses. Nearly half, or 70%, of the workers who answered this question did provide additional comments. As a measure of interest or importance, this was the most responded to question of any in the survey.

Responses to effectiveness of their high school education, by state.

Only three states had responses in the double digits. Of them, most responses from both Illinois, 80%, and Missouri, 82%, felt that their high school prepared themselves for success only "Moderately Well," "Slightly Well," or "Not Well at All." That is in contrast with the results from Wisconsin, which was only 50% for the same responses. Additional survey response demographics can be found in Appendix B. Future research should put an emphasis on acquiring larger data sets from more comparable states to better compare outcomes between an even larger number of states.

Responses to effectiveness of their high school education, by race comparing white male responses to all other responses.

The non-white male responses combined was a smaller sample than desired, but some comparisons could be drawn when looking at all the non-white male responses and comparing them to the responses of white males. The white male responses (139) vs an aggregate of non-white male responses (22) found white male responding 81% that high school prepared them 'moderately well', 'slightly well' and 'not well at all' versus a 66% by the non-white male responses in the same category to the same question. It is not clear why non-white-male workers have a more favorable view of their high school experience.

Only 3.4% of the survey responses identified as being Latinx/Hispanic; 100% of the Latinx/Hispanic responses felt that new workers coming into the construction industry have "A Great

Deal or More Skills,” “Some Additional Skills,” or “The Same Skills” that they had when they entered the workforce. A sharp contrast to the 54% of the non-Latinx/Hispanic who answered this question the same way.

Response to: Effectiveness of Their High School Education, by Gender.

Here, we also have a small sample. Female construction workers rate their high school experience “Extremely Well,” “Very Well,” or “Moderately Well” 72% of the time versus their male co-workers 54% of the time.

Table 1. Responses to: Effectiveness of Their High School Education, by the Length of Time in Their Career.

Length of Time in Their Current Career	Extremely Well	Very Well	Moderately Well	Slightly Well	Not Well at All
0 – 2 Years	1 (2%)	6 (14%)	15 (34%)	11 (25%)	11 (25%)
3 – 5 Years	2 (6%)	6 (18%)	13 (39%)	5 (15%)	7 (21%)
6 – 8 Years	1 (12.5%)	1 (12.5%)	1 (12.5%)	4 (50%)	1 (12.5%)
9 – 10 Years	-	-	3 (43%)	2 (29%)	2 (29%)
10 – 15 Years	1 (8%)	1 (8%)	1 (8%)	5 (39%)	5 (39%)
15 – 20 Years	2 (14%)	4 (29%)	4 (29%)	1 (7%)	3 (21%)
More than 20 Years	4 (9%)	6 (14%)	14 (33%)	6 (14%)	13 (30%)
Total Responses 162	11 (7%)	24 (15%)	51 (32%)	34 (21%)	42 (26%)

Workers with 15 to 20 years’ experience in the construction field have a more positive perspective of their high school education than the other demographics of workers. These workers responded to the midpoint to lower survey scale, “Moderately Well,” “Slightly Well,”

and “Not Well at All,” 57% of the time. That was more favorable than the 84% of the zero-to-two-year demographic or the 75% for the three to five years as well as the six to eight year or the 100% of the nine to 10 year and the 77% of the more than 20-year groups. The other research questions do not explain the difference in results between the demographic. Yet overall, 79% responded that high school prepared them moderately well, slightly well, or not well, making it clear that current workers do not believe high school prepared them for success.

Responses to: Effectiveness of Their High School Education, Based on High School Completion.

While 78% of the survey takers who answered the question of their high school completion status, responded that their high school experience prepared them “Moderately Well,” “Slightly Well,” or “Not Well at All,” of those who completed their high school with a GED was most interesting. Ninety-eight percent of those who completed high school with a GED said their high school experience prepared them “Moderately Well,” “Slightly Well,” or “Not Well at All.” There were a small number of responses, seven in total, who did not complete high school. It was determined that it was too small of a sample to draw reliable conclusions.

Table 2. Responses to: Effectiveness of their high school education, by generation

Generation	Extremely Well	Very Well	Moderately Well	Slightly Well	Not Well at All
Gen Z, iGen, or Centennials Born 1996 – present	-	6 (24%)	6 (24%)	6 (24%)	7 (28%)
Millennials or Gen Y 1977 – 1995	5 (6%)	9 (11%)	24 (30%)	19 (24%)	22 (28%)
Generation X 1965- 1976	1 (3%)	5 (16%)	12 (38%)	5 (16%)	9 (28%)
Baby Boomers 1946 – 1964	4 (17%)	3 (13%)	9 (39%)	3 (13%)	4 (17%)
Traditionalists or Silent Generation Born 1945 or before	-	-	-	-	-
Total responses 159	10 (6%)	23 (15%)	51 (32%)	33 (21%)	42 (26%)

More Millennials, or Gen Y, workers answered this question than any other generation, with 79 of 159 or 50% of the survey responses to this question where ages were also provided. That was followed by Generation X with 32 of 159, 20%, of the responses. Both the Millennial and Generation X rated their high school experience as preparing them “Extremely Well” or “Very Well” 17% and 19%, respectively, for the careers in construction, contrasts with Gen Z and Baby Boomer generations, 24 % and 30%, respectively, responses to the same question.

Earlier the survey respondents assess their high school educations, with respect to how well it prepared them for success in their careers in the construction industry. This created a benchmark to compare other questions to, establishing a point of reference when answering the question of “Do you feel that the workers entering the workforce today have the same skill(s) needed to be successful as you and your generation did when you entered the workforce?”

The unfiltered response was overwhelming that the current workers believe new entrants to the workforce have less of the skills needed to be successful than when they had entered the workforce. This was the second most popular question commented upon. Two of the additional comments included in the responses were “A lot of newer people coming into my workforce stand around to be told what to do instead of asking or know from the previous day,” and “They are lacking discipline, Focus, Problem-solving skills, lack communication skills, lack understanding, discretion, and discernment.”

Responses to: Does the new workforce have the same skills you had, by gender.

Females responded that the new entrants to the workforce possess “A Great Deal or More Skills,” “Some Additional Skills,” or “Have the Same Skills,” 83% of the time to males responding the same way only 49% of the time. This was a small sample size. Yet, six of the seven female construction workers taking the survey, responded consistently and that fact should not be overlooked. This question with these demographics would benefit from a larger study to see if this outcome is replicated with a larger sample.

Table 3. Responses to: Does the new workforce have the same skills you had, by the length of time in their career.

Length of Time in the Current Career	A Great Deal More Skills	Some Additional Skills	Have the Same Skills I Had	Fewer Skills	Substantially Fewer Skills
0 – 2 years	3 (7%)	8 (19%)	19 (44%)	11 (26%)	2 (5%)
3 – 5 years	4 (13%)	5 (16%)	6 (19%)	13 (42%)	3 (10%)
6 – 8 years		1 (17%)		4 (67%)	1 (17%)
9 – 10 years		1 (25%)	1 (25%)	1 (25%)	1 (25%)
11 – 15 years	2 (22%)	1 (11%)	1 (11%)	2 (22%)	3 (33%)
16 – 20 years	2 (18%)	1 (9%)	1 (9%)	5 (46%)	2 (18%)
More than 20years	2 (5%)	8 (21%)	7 (18%)	12 (31%)	10 (26%)
Total Responses 143	13 (9%)	25 (18%)	35 (25%)	48 (34%)	22 (15%)

In Table 3 we find the overwhelming majority (89%), of the workers with 0 – 2 years' experience in their current careers responded that they feel new entrants to the workforce have "Some Additional Skills," "The Same Skills," or "Fewer Skills." With 43 (or 30%), of the responses, they also constitute most of the total responses to this question. Contrast that to the 11 – 15 year and the 16 – 20-year groups who responded, 44% and 64%, respectively. Workers with 6 – 8 years' experience responded 84% of the time that they felt new workers possess "Fewer Skills" or "Substantially Fewer Skills."

Responses to: Does the new workforce have the same skills you had, based on high school completion.

Other than those who did not graduate from high school, who responded 80% of the time that new workers have "Substantially Fewer skills," the demographics are consistent with the aggregate results on this question. The majority, 57%, of the workers responding to this question feel that new workers entering the construction trade possess the "Same Skills" or "Fewer Skills" as when the respondents started their career.

Table 4. Responses to: Does the new workforce have the same skills you had, by generations.

Generation	A Great Deal More Skills	Some Additional Skills	Have the Same Skills I Had	Fewer Skills	Substantially Fewer Skills
Gen Z, iGen, or Centennials Born 1996 – Present	1 (4%)	6 (24%)	10 (40%)	6 (24%)	2 (8%)
Millennials or Gen Y 1977 – 1995	7 (11%)	9 (13%)	19 (28%)	22 (33%)	10 (15%)
Generation X 1965- 1976	1 (4%)	5 (17%)	4 (14%)	14 (48%)	5 (17%)
Baby Boomers 1946 – 1964	2 (11%)	4 (21%)	3 (16%)	5 (26%)	5 (26%)
Traditionalists or Silent Generation Born 1945 or Before	-	-	-	-	-
Total Responses 140	11 (8%)	24 (17%)	36 (26%)	47 (34%)	22 (16%)

Millennials, or Gen Y, workers answered this question in a higher number than any other generation with 67 responses. The responses from Gen Z, Gen X, and Baby Boomers were consistent at 25, 29, and 19, respectively. In Table 4 we see the younger workers, Gen Z, responding 32% of the time that new workers entering the workforce have “Fewer Skills” or “Substantially Fewer Skills” than when they did. That are differences in responses from Gen Y, Gen X, and the Baby Boomer generations who responded 48%, 65%, and 52%, respectively. Half of all the workers who answered this question feel that new workers are entering the trade with “Fewer Skill” or “Substantially Fewer Skills” than they did.

Response to question: What skills do you believe the current new members of the workforce are lacking?

Following up on the question ‘Do you feel that the workers entering the workforce today have the same skill(s) needed to be successful as you and your generation did when you entered the workforce?’ the follow-up question asked: ‘What skills do you believe the current new members of the workforce are lacking to be successful? There were 131 responses to this follow-up question with 57 responding that “More Industrial Arts Skills” are needed, 23 felt that “More People Skills” are needed as well, and 23 felt “More Technical Skills” are needed.

Responses to question: Will workers in the future have the skills needed to be successful in this trade?

Of the 175 responses to the survey 143, 82%, answered this question. Of those responses, 49 said no they would not, 48 responded that yes, they would, while 46 did not know. Two-thirds of the workers who responded to this question do not believe or are not confident that future high school graduates will possess the skills needed to be successful in the field of construction.

Finally, we asked what skills future workers will need more of. Their opinions are reflective of their experiences as both workers, and in many cases, they are trainers of the newer workers. This question looks forward, at how well high schools are preparing students for entering the future workforce. The majority, 59, responded that more industrial arts skills or training are needed. Just over half that, 30 responses, felt that additional people skills are needed. Only 6 responded that more screen skills are needed for future workers to be successful in this industry.

Conclusion and Recommendations

Most of the workers surveyed did not think their high school prepared them for success in this career. The overwhelming majority felt that current new entrants to the workforce are even less prepared to be successful than when they entered the workforce. Clearly, 50% of all the workers responding to the question felt that new workers are entering the trade today with “Fewer Skill” or “Substantially Fewer Skills” than they did. Furthermore, two-thirds of the workers who responded to the question are not confident that future high school graduates will have the skills needed to be successful in the field of construction. This does not bode well for the future of this industry.

The study found that high schools should do more to promote careers, like these in construction, that do not require a college education. It is felt that educational systems do not provide a similar amount of support for industrial arts-based careers as college/university education receives. Whether by intent or by accident, it is felt that high schools are steering all students to college as a default.

Findings included that high schools need to incorporate more problem-solving skills into course curricula, so students develop the confidence and problem-solving skills needed to be successful, in any field. Learning to work in multi-generational workforces, as opposed to just being in class with people their age, would also strongly benefit students' abilities to acclimate into any workforce.

It was also found that current new workers entering the construction workforce today struggle as problem-solvers, self-starting and are afraid to make mistakes, losing the opportunity to learn from them. Criticisms aside, it was felt that new workers do not know what they are capable of accomplishing. Students entering the field need to be more self-reliant and able to solve their own problems and take responsibility for their work and their actions. High schools are positioned to help students become more self-reliant before they embark upon their careers, regardless of what that career might be.

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APPENDIX A

Survey questions:

Q1 – You are invited to participate in a research study being conducted by Douglas J. Swanson. The purpose of this research is to answer the question, ‘how well do construction workers believe a high school education prepared student for success in the workforce’ and will take about 10 minutes.

Participation in the study is voluntary. You may withdraw from of the study at any time without penalty. Participants are encouraged to answer all of the questions but are under no obligation and may not answer individual questions.

Taking the survey constitutes your consent and acknowledges your opportunity to ask questions.

Q2 - What is your current age?

Q3 - What is your gender?

Q4 - What is your race?

Q5 - What ethnicity do you identify as?

Q6 - What year did you last attend high school?

Q7 - Did you complete high school?

Q8 - What is your current career?

Q9 - How long have you been in your current career?

Q10 - In what state did you attend high school? (If you went to high school in more than 1 state, choose the state where you spent the majority of those years).

Q11 - How well do you feel your high school education prepared you to be successful in your career?

Q12 - When you were in high school, do you feel you were being prepared to go:

For the next several questions, we will use the terms like ‘Industrial Arts’, ‘Technical Skills’ and ‘People Skills’. For these questions, use the following definitions:

An Industrial Arts educational could include:

- Fabrication of objects in wood, metal, plastics or composites;
- Use of a variety of hand, power, or machine tools;
- Electrical or electronics systems installation or repairs;
- Small engine repair; and
- Automobile maintenance and repair.

Example of Industrial Arts careers would include:

- Construction industry jobs;
- Mechanics; and
- Tool and die makers.

Industrial Arts jobs are sometimes referred to as jobs where you are ‘working with your hands.’

Technical Skills education could include:

- Skills utilized in operating computers and tablets run machines,
- Installing programs and up-keeping systems that are necessary to operate equipment, machinery and/or to input data for the equipment and machinery to operate.
- Skills needed in operating programs and applications that are accessible through touchscreens. These jobs do not rely on basic office skills (word-processing, spreadsheets, and PowerPoint) computer skills but some data entry may be used.

Examples of Technical Skill job include:

- 3D printer operator;
- Machinist; and
- Machine operator (i.e., lathe, punch press, etc.)

Technical Skills jobs are sometimes referred to as jobs that require workers to operate or use ‘screens’ to access equipment and/or programs or spend a lot of ‘screen time’ during their work shift.

People Skills: is a broad umbrella term for skills intended to improve a person’s interaction, intercession and personal effectiveness skills when working with other people. People skills jobs often require one to develop teamwork, problem-solving, and emotional intelligence skills.

Examples of People Skills jobs would include:

- Customer service
- Sales and
- Jobs in the service sector

People Skills job educational programming may have focused on skills like:

- Speech / Oral Communications
- Psychology and
- Human relations

- Q13 - Did the high school that you attended for the longest part of your high school tenure offer an industrial arts program?
- Q14 - Did you enroll in any industrial arts courses?
- Q15 – did the industrial arts courses that you took in high school help you to prepare to be successful when you entered the workforce?
- Q16 - Did the high school that you attended for the longest part of your high school tenure have courses that helped you with computer/screen skills that you utilize in your work today?
- Q17 - If yes, did you enroll in any technical skills courses?
- Q18 - Did the technical skills courses that you took in high school help you to prepare to be successful when you entered the workforce?
- Q19 - Did the high school that you attended for the longest part of your high school tenure have a program that provided you the skills that you need to work well in industries that demanded good ‘people skills?’
- Q20 - Did you enroll in any people skills courses?
- Q21 - Do you think the people skills courses helped to prepare you to be successful when you entered the workforce?
- Q22 - Today, can someone with only a high school education be successful in an entry-level position in your profession?
- Q23 - Does your current career have a training or apprenticeship program?
- Q24 - Is there a fee required to enter the training or apprenticeship program?
- Q25 - Once you entered the training or apprenticeship program was there a cost to continue in the program?
- Q26 - In total, how much did the training cost you?
- Q27 - Is the training/apprenticeship program industry recognized and transferable to other states (or countries)?
- Q28 - If you answered yes, your craft/profession has a training/apprenticeship program, is it able to attract all of the new workers to its training/apprenticeship program that it needs to meet current demand?
- Q29 - As your industry is changing, do you believe your current craft/profession training/apprenticeship program is going to be able to attract enough new members to meet the future demands for workers?
- Q30 - Typically, how long does it take someone to complete the training/apprenticeship program?

- Q31 - Regarding the knowledge it takes to be successful in your trade, do you think your job is more or less complicated or complex than when you started in your current career?
- Q32 - Do you feel that the workers entering the workforce today have the same skill(s) needed to be successful as you and your generation did when you entered the workforce? Please complete the following sentence that best describes your views.
- Q33 - What skills do you believe the current new members of the workforce are lacking in order for them to be successful?
- Q34 - Think about how much the skills needed to be successful in your job have changed or have not changed over the past 5 - 10 years. Taking into consideration the skills you observe in current entry-level workers, do you think workers entering the workforce 5 - 10 years from now will possess the skills needed to be successful in your trade?
- Q35 - What skills do you believe the current entry-level workforce lacks in order for them to be successful in today's workforce?

APPENDIX B

Survey Responses Demographics

States where respondents finished high school.

Responses were received from workers who completed high school in 25 different states and two foreign countries. One response from each of Alaska, Florida, Idaho, Louisiana, Jamaica, Mexico, Michigan, Minnesota, Ohio, Oklahoma, Oregon, Tennessee, Texas, Virginia, Washington, West Virginia, each state representing 0.6% of the responses. There were two responses from both Iowa and Massachusetts for 1.2% of the responses from each state. The following states each had three, or 1.81%, of the responses Indiana, Kansas, New Jersey, New York, and Pennsylvania. The top responses came from Illinois, with 70, or 42.17%, Missouri with 51, or 30.72% and Wisconsin providing 10, or 6.02% of the responses.

Survey Responses, by year leaving high school

The largest survey responses, with 46 responses or 27.71% had zero to two years of experience in their career, followed very closely by 45 responses or 27.11% with more than 20 years in the industry. This was followed by 33 responses or 19.88% for three to five years of experience. It was interesting to see the nearly identical response rates between the least experienced and the most experienced demographic.

This broad spectrum of responses provides a very insightful sampling of the workforce. Having a sampling that is anchored a bit heavier in the zero to two as well as the more than 20-year categories provide insight from both ends of the experience spectrum to the questions related to how well the current workforce leaving high school recently is prepared for success.

Responses, by the Length of Time in Their Current Career.

Forty-six (27.71%) of the responses left high school 0 - 2 years prior to taking the survey, followed closely by 45 responses (27.11%) having left more than 20 years ago and 33 (19.88%) leaving 3 - 5 years ago. The remaining responses where 6 - 8 (4.82%), 9 - 10 (4.22%), 11 - 15 (7.83%) and 16 - 20 (8.43%) years ago.

BLS Household Data Annual Averages

Some Bureau of Labor Statistics data were used to provide a comparison of the survey results to the overall industry representation. The data used was: Employed Persons by Detailed Industry, Sex, Race, and Hispanic or Latino Ethnicity.

Industry	2019					
	Total employed [Numbers in thousands]	Women	White	Black or African American	Asian	Hispanic or Latino
Total, 16 years and over	157,538	47.0	77.7	12.3	6.5	17.6
Construction	11,373	10.3	88.1	6.4	1.9	30.4

(U.S. Bureau of Labor Statistics, 2020)

The BLS 2019, Household Data Annual Average reported on White, Black, or African American, Asian, and Hispanic, or Latino race demographics. The BLS notes: “Estimates for the above race groups (White, Black or African American, and Asian) do not sum to totals because data are not shown for all races. Persons whose ethnicity is identified as Hispanic, or Latino may be of any race.”

Responses, by Race.

The survey tool used took a much broader look at races in the workforce than the BLS reported. Due to the limitation of not having all the same race’s data reported, a true comparison to the BLS survey data would not be accurate. By doing a side-by-side comparison for all the races surveyed to those reported by the BLS we can still see that the White workers responded to the survey at a much higher rate than they represent in the workforce. One hundred sixty-five respondents answered the question of race.

Responses that could be compared to BLS statistic were white/Caucasian with 152 (92.12%), versus BLS findings of 88.1%, black/African American 4 (2.42%), compared to BLS findings of 6.4% and Asian, 1 (0.61%) with a BLS results of 1.9%. Races noted without BLS comparable American Indian/Alaska Native, 2 (1.21%), Native Hawaiian/other Pacific Islander, 1 (0.61%), two or more races, 2 (1.21%) and other, 3 (1.82%).

Responses, by Ethnicity.

Of the 137 responses to this question in the survey, 5.11% of the survey responses identify as Latinx/Hispanic. This is well below the BLS Employed Person by Industry Index 2019 where the BLS determination of upwards of 30% of the construction industry being Hispanic or Latinx.

Responses, by Gender.

The BLS determined females constitute 10.3% of the construction industry. The survey was responded to by eight women in the construction field, a mere 4.82% of the overall responses, which totaled 166 for this question. This was less than the BLS determination of women’s presence in the construction industry.

Responses by Completion of High School.

The overwhelming majority, 80.72%, graduated high school with another 15.06% earning their GEDs.

Responses, by High School Completion, by Generation.

Apart from no responses from the Traditionalist or Silent Generation, the sample response was very satisfactory. The range of responses by Generation runs from the lowest response of 10.24% for the Baby Boomer Generation to 37.35% for the Millennials or Gen Y Generation. In which this author believes provides ample data for comparing data responses across the generations.

Average Age of Responders.

One hundred sixty-four of the respondents to the survey provided their age. The model sample for the survey was someone who had been out of high school for 20 years. The average age of the survey responses, 38.77 years, fits ideally with the goals of the research.

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The *International Journal of Vocational Education and Training* reflects regional contributions and is international in scope. Its purposes are to provide a forum for the discussion of vocational education and training issues and practices; to assist in the dissemination of information on research and practice; and to strengthen the lines of communication among individual researchers and practitioners, institutions, and organizations. In addition, it provides a platform for individual views on relevant issues.

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Tables and Figures. Tables and figures should relate directly to the content of the manuscript and should not repeat information given in the text. Tables and figures can be produced in either color or black and white. Figures should be provided on high-quality, glossy white paper and should fit on one page. Tables should not exceed one page, and there should be no more than three tables per article. Also, do not place table or figure titles inside the table or figure.

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