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**Luke J. Steinke  
Editor**

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# International Journal of Vocational Education and Training

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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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<i>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.</i>	

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## Message From the Editor

Welcome to a new year and the first issue of the 26th volume of the International Journal for Vocational Education and Training. This journal has long provided opportunities for those within the field of Technical Vocation Education and Training (TVET) to publish their research and discuss issues facing the profession. What has made this publication unique is that it offers a global perspectives on TVET, with articles and researchers participating from all over the world.

This issue offers a variety of different articles touching on different TVET subjects. The first several articles focus on specific TVET issues within Nigeria. These articles address key factors related to agriculture, construction, and overcoming poverty. The last two articles focus on TVET challenges within Germany and the United States respectively. 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.

When I was asked to take on the role of editor at the beginning of the year, I recognized the challenge that such an endeavor entailed. Yet as I looked back at the long history of the journal and its editors, I am honored to be following in the footsteps of so many that I have long read and respected. It is my hope that I can carry on the work they started and do it the justice it deserves. With this being my first issue as editor, I would like to thank everyone that made this issue possible. As we all are facing challenges due to a worldwide pandemic, I truly appreciate everyone's patience, understanding, and support. As always, we are 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](mailto:lsteinke@iveta.global).

Luke J. Steinke, PhD

A handwritten signature in black ink, appearing to read 'Luke J. Steinke', with a stylized, flowing script.

Editor—International Journal for Vocational Education and Training



# **IMPACT OF PRINCIPALS' LEADERSHIP STYLES ON STUDENTS' ACADEMIC PERFORMANCE IN AGRICULTURAL SCIENCE IN SENIOR SECONDARY SCHOOLS IN ADAMAWA STATE, NIGERIA**

**Harrison Gideon Maghra**

## **ABSTRACT**

The purpose of the study was to find out the impact of Principals' Leadership Styles on Students' Academic Performance in Agricultural Science in Senior Secondary Schools in Adamawa State. The study identified two leadership styles, answered two research questions and tested two hypotheses at 0.05 level of significance. Descriptive survey research design was used for the study. A structure questionnaire designed by the researcher was used to collect data from a sample of 235 respondents made up of 28 principals and 207 Agricultural Science teachers. Mean and standard deviation was used to answer the research questions and the t-test statistic was used to test the hypotheses at 0.05 level of significance. The study concluded that democratic leadership style contributes positively to students' academic performance in Agricultural Science in senior secondary schools, while Autocratic leadership style does not contribute to improved students' academic performance in Agricultural Science in senior secondary schools. The results showed that students performed exceptionally in academic work as the principal boost the morale of teachers through delegation of responsibilities which makes the teacher feel among and enhances teacher's productivity under democratic leadership style. The study found that no significant difference existed between the responses of principals and teachers on the impact of democratic leadership style and autocratic leadership style on students' academic performance in Agricultural Science in senior secondary schools. The study, recommended that the legislative arm of the government both federal and state should not only strive to enact educational laws but also set aside a committee to monitor schools ensuring that all principals of senior secondary schools adopt appropriate leadership styles towards enhancing students' performance.

**Keyword:** Leadership, Autocratic leadership, Democratic leadership, Principal, Academic performance and Agricultural Science.

## Introduction

Leadership has a great influence on the growth and development of any organization. It is a crucial element that determines the success of any organization. This is because those who occupy leadership positions in different organizations engage in motivation, supervision, instruction and even command in order to make people stand up to their responsibilities for effective performance. Lin and Chuang (2014) indicated that the performance of any group can be set by the performance of a leader. Similarly, Kotter (2007) asserted that leadership is probably sole key that makes ordinary people achieve extraordinary and astonishing things. In the schools' system, the productivity of the teachers, performance behaviour of the students and the general performance of the system are anchored within the school leader. Additionally, Akan (2013) research highlighted the key features exhibited by school administrators significantly affects the school's functioning and student success.

Marzano (2000) illustrated that school leadership is a decisive factor underpinning the "key variables" in the school, Marzano argued that these variables are divided into school-level variable which involves opportunity to learn, time, monitoring, pressure to achieve, parental involvement, climate, leadership and cooperation. Teacher-level variables (which are instruction, curriculum design, class room management) and students-level variable (which includes home atmosphere, aptitude/prior knowledge, and interest, and leadership acumen has a lot to do with effective administration and management of the school. Akan (2013) observed that the effectiveness of schools, which are at the centre of the educational organizations, depends to a great extent on the effectiveness of the administrators who are responsible for conducting school activities and teacher curriculum.

According to Uris (1994) autocratic leadership style is by far the oldest of the leadership styles. In this leadership style, the principal determine policy and consider decision making a one-man operation for him being the leader. Uris argued that autocratic leadership in certain situations is the most effective and successful form of leadership styles where other styles fail. Principals who practices such style of leadership tends to make decision quickly, set out clear instruction for what and how things need to be done, create demarcation between himself and his staff and the communication style is generally one way (Dinham & Scott, 2008).

Uris (1994) believed that democratic leadership style idea has equally vague beginnings, but it was the Greece that the term originated from and also it was in Greece that the government form described as "democratic" developed. With this form of leadership, the principal draw ideas and suggestions from the teachers by discussion and consultation. He also believed that staff members are encouraged to take part in setting policy and decision-making process. The leader's job is largely that of moderator. Here, employers of such leadership style refrain from the final vote despite allowing group participation, decision making process can be slow and consensus hard to reach, team members are motivated and feel part of a creative process, the leader offer guidance, participates in the group and seek input from group members (Dinham & Scott, 2008).

The Federal Government of Nigeria considers education as the best investment that a nation can have for rapid growth and development of the economic, political and human resources of its citizenry. It is also the most important investment for change in social, economic and intellectual well-being of any society (FRN, 2013). The National Policy on Education (FRN, 2013) further explains that one of the measures that would ensure the improvement of effective education in secondary schools is the selection of a suitable and qualified person as principal of the school.

Agricultural Science Education is a type of vocational training involving the equipping of the learners with the key knowledge and skills involved in productive agriculture. It involves training of both the head and the hands of the learner (Ola, 2014). Agricultural Science Education entails the use of scientific knowledge in the teaching and learning of food production through the acquisition of knowledge of crop production, livestock management, soil and water conservation and other associated benefits for industrial and human development (Odogwu, 2005 in Ola, 2014).

At the senior secondary school level, the objective of teaching and studying agricultural science according to Federal Republic of Nigeria (FRN) (2013), include:

- i. To stimulate and sustain students interest in agriculture
- ii. To enable students to acquire basic knowledge of agriculture.
- iii. To prepare students for future studies in agriculture.
- iv. To expose students to job opportunities in the field of agriculture.
- v. To enable students to integrate knowledge with skills in agriculture.

The above objectives can only be attained through effective instruction and motivation of students by teachers of agricultural science and that can be determined through the principals' leadership style.

Students' academic performance forms the gauge through which goal attainment can be measured in the educational system. Results from external examinations' show poor performance of senior secondary school students in West African Examination Council, National Examination Council or/and in any other related external examinations which are meant to qualify them for higher education. However, the leadership styles of principals are mostly regarded as a factor that contribute to the poor academic performance (WAEC, 2013).

In Adamawa State of Nigeria, the advent of democratic leaders has marginally contributed to the development of education. Since the resumption of democratic governance in 1999, school personnel were employed, equipment and facilities provided in schools in order to improve the welfare of teachers and condition of schools. These efforts are expected to yield positive results in terms of school productivity and students' achievement in public examinations like the West African Examination Council (WAEC), General Certificate of Education (GCE) and National Examination Council Certificate Examination (NECO). Despite these efforts however, the

performance of students in senior school certificate examinations (SSCE) WAEC and NECO continue to decline drastically. For example, in 2012 in Adamawa State, only 1,706 candidates passed with five credits out of 32,410 students that sat for West African Examination Council (WAEC), this shows that academic performance of senior secondary school students in Adamawa State was very low. Statistics from the Ministry of Education (Planning Division) 2012 in Adamawa State revealed that an average of only two candidates out of one hundred students that sat for SSCE qualified for university admission. The record further revealed that up to an average of 24.2 percent of the candidates presented for the examination graduated without a single pass in any of the subjects registered for the examination.

The dwindling academic performance of students has been blamed on several people with principals' leadership failure at the top of the list. Oluremi (2013) pointed out that when examining the poor performance of students in the school certificate examinations some blame the school administrators (principals) and teachers while others blamed the students themselves and their parents. Adeyemi and Ogonor (1997) suggested that principals who could lead students to success are those who are trained in leadership strategies and skills, stressing that such principals understand that school and classroom practices improve student's achievement. The trained principals also know how to work with other teachers to bring about success or positive change, support teacher in the choice and provision of infrastructure facilities that could help all student success and can prepare dedicated teachers to become principals themselves.

Based on the fact that teachers constitute a good variable for measuring a principal's potential, this study therefore, investigates the impact of principals' leadership styles on academic performance of senior secondary school students in Agricultural Science in Adamawa State, Nigeria.

### **Statement of the Problem**

According to Oluremi (2008) principals have a unique role in school organization. Robinson (2007) asserted that politicians, policy makers, and the public at large are convinced that the quality of school leaders and of principals in particular, makes a substantial difference to the progress students make at school. Therefore, due to the important role of the principal's in school administration, they share, if not a large portion, in the credit or blame for performance of students in examinations. Principals have not been able to blend well due to scarce resources to achieve better or greater purpose in their administrative function.

Due to the growing concern on the rate of students' failure in national examinations, principals are blamed for much of the poor performance of senior secondary school students. Because they are saddled with the responsibilities of running day to day administration of schools, the leadership style adopt by the principal would either yield excellent or poor academic performance in schools.

Principal's leadership style has contributed to the challenges students of senior secondary schools have encountered in their pursuit of knowledge through teaching and learning process which result to poor performance in national examinations such as West African Examination Council (WAEC), National Examination Council (NECO), General Certificate of Education (GCE) and some other examinations. This study finds the need to look at some leadership styles and their impact on student academic performance in agricultural science in senior secondary schools.

### **Purpose of the Study**

The purpose of the study is to determine the impact of principals' leadership styles on students' academic performance in Agricultural Science in Senior Secondary Schools in Adamawa State. Specifically, the study seeks to:

1. Ascertain the impact of democratic leadership style on students' academic performance in Agricultural Science in senior secondary schools in Adamawa State.
2. Ascertain the impact of autocratic leadership style on students' academic performance in Agricultural Science in senior secondary schools in Adamawa State.

### **Research Questions**

The study intends to answer the following questions.

1. What is the impact of democratic leadership style on students' academic performance in Agricultural Science in senior secondary schools in Adamawa State?
2. What is the impact of autocratic leadership style on students' academic performance in Agricultural Science in senior secondary schools in Adamawa State?

### **Hypotheses**

The following null hypotheses were formulated to guide the study, and were tested at 0.05 level of significance:

**H<sub>01</sub>.** There is no significant difference between the mean scores of the responses of principals and teachers on the impact of democratic leadership style on students' academic performance in agricultural science in senior secondary schools in Adamawa State

**H<sub>02</sub>.** There is no significant difference between the mean scores of the responses of principals' and teachers on the impact of autocratic leadership style on students' academic performance in agricultural science senior secondary schools in Adamawa State

## Methodology

The study made use of descriptive research design. The study was carried out in Adamawa State. The state is located within the North-East Geo-political zone, Adamawa State lies between latitude  $7^{\circ}$  and  $11^{\circ}$  North of the equator and between longitude  $11^{\circ}$  and  $14^{\circ}$  East (Adebayo & Tukur, 1999). The total population of the study was 456 respondents made up of 128 principals and 328 agricultural science teachers. Taro Yamane formula for finite population was used to obtain the sample size for teachers which stood at 207. The instrument for data collection was a structured questionnaire which was developed by the researcher. The research instrument was subjected to face and content validity by three experts, one from Department of Science Education and two from Department of Vocational Education, both from Modibbo Adama University of Technology, Yola. The reliability of the instrument was determined by carrying out a field trial test of the questionnaire with 30 respondents, comprising 25 agricultural science teachers and 4 principals from Government Day Secondary Schools Zing and Government Day Secondary Schools Model, Jalingo. The respondents for the test were scored on a five-point response Likert scale. Cronbach's alpha method was used for establishing internal consistency as it is the most appropriate tool for establishing reliability of instrument. The 60-item instrument was administered personally by the researcher. The data collected from the respondents were analysed using mean ( $\bar{x}$ ) and standard deviation (B) for answering the research questions; t-Test was used to test the hypothesis at 0.05 level of significance.

## Results and Discussion

### Research Question 1

What is the impact of democratic leadership style on students' academic performance in agricultural science in senior secondary school in Adamawa State? Table 1 in Appendix A provides data that answered this research question.

Table 1 presents data on the impact of democratic leadership style on students' academic performance in senior secondary schools. Out of the 12 items on the table, respondents agree with all the items as having impact on student academic performance in agricultural science in senior secondary school. The grand mean scores of respondents ranged between 4.05 and 4.67. The standard deviation scores of the respondents ranged between 0.28 and 1.57. The result shows that the responses of the respondents are not widely deviated from one another. The whole grand mean scores of the table stood at 4.33. This result shows that respondents agreed that, principal democratic leadership style has impact on students' academic performance in agricultural science in senior secondary schools in Adamawa State.

### Research Question 2

What is the impact of autocratic leadership style on students' academic performance in

agricultural science in senior secondary school in Adamawa State? Table 2 in Appendix B provides data that answered this research question.

Table 2 contains data on the impact of autocratic leadership on student academic performance in agricultural science in senior secondary schools. The table has 13 items. Respondents agreed on seven items and were undecided on six items. The items respondents agreed on are 2, 5,6,8,10,11 and 13. Their grand mean scores ranged between 3.54 and 4.16. The items respondents had undecided are 1, 3,4,7,9, and 12. Their grand mean scores ranged between 2.95 and 3.42. The standard deviation scores of the respondents ranged between 0.99 and 1.58. This indicates that the views of the respondents were not widely deviated from each other. The grand mean score of the table regarding the impact on student academic performance in agricultural science in senior secondary school was 3.54. This indicates that respondents agreed that principals' autocratic leadership style has impact on students' academic performance in agricultural science in senior secondary schools in Adamawa State.

### **Hypothesis 1**

There is no significant difference between the mean scores of the responses of principals and teachers on the impact of democratic leadership style on students' academic performance in agricultural science in senior secondary schools. The data of table 3 in Appendix C were used to test this hypothesis.

Hypothesis 1 tested for significant difference between the mean scores of principals and agricultural science teachers on the impact of democratic leadership style on students' academic performance in agricultural science in senior secondary schools. At degree of freedom (df) 153, t-cal of 1.13 was less than t-crit of 1.96. This result shows that there is no significant difference between the mean scores of principals and agricultural science teachers on the impact of democratic leadership style on student academic performance in agricultural science in senior secondary schools. Therefore, the null hypothesis  $H_{01}$ , is upheld.

### **Hypothesis 2**

There is no significant difference between the mean scores of the responses of principals and agricultural science teachers on the impact of autocratic leadership style on students' academic performance in agricultural science in senior secondary schools. The data of table 4 in Appendix C were used to test this hypothesis.

Hypothesis 2 tested for significant difference between the mean scores of principals and agricultural science teachers on the impact of autocratic leadership style on student academic performance in agricultural science in senior secondary schools. At degree of freedom (df) 153, t-cal of 0.86 was less than t-crit of 1.96. This result shows that there is no significant difference on the mean responses of principals and agricultural science teachers regarding the impact of autocratic leadership style on students' academic performance in agricultural science in senior secondary school. Therefore, the null hypothesis,  $H_{02}$ , is upheld.

## Discussion

The result shows that respondents agreed that, principal democratic leadership style has impact on students' academic performance in agricultural science in senior secondary schools in Adamawa State. The findings reveal that respondents agreed that principals' autocratic leadership style has impact on students' academic performance in agricultural science in senior secondary schools in Adamawa State. There was no significant difference between the mean scores of principals and agricultural science teachers on the impact of democratic leadership style on students' academic performance in agricultural science in senior secondary school. Therefore, the null hypothesis  $H_{01}$  was upheld. The study found that there is no significant difference between the mean scores of the responses of principals and agricultural science teachers on the impact of autocratic leadership style on student academic performance in agricultural science in senior secondary school. Therefore, the null hypothesis  $H_{02}$  was upheld.

## Conclusion

The findings of the study form the basis to make the following conclusion. In senior secondary schools in Adamawa State, students perform excellently in agricultural science when principals employ democratic leadership style in running day to day administration of their schools, these can be seen in areas like when principal delegate's responsibilities to agricultural science teachers, when principal make himself available to agricultural science teachers on issues regarding students' academic performance in agricultural science.

Furthermore, when there are regular staff meeting for sharing of ideas on school work, agricultural science teachers participate in decision making, when there is a cordial relationship between the principal and agricultural science teachers, when agricultural science teachers are recommended to attend seminars and workshop in their subject areas.

## Recommendations

Based on the findings, the following recommendations are made; Hence democratic leadership styles can create impact on student academic performance in agricultural science, the legislative arm of Government whether at federal or state level should not only strive to enact educational laws but also set aside a committee to monitor schools to ensure that all principals of senior secondary schools adopt democratic leadership style.

According to the finding, autocratic leadership style also has impact on student academic performance in agricultural science. Therefore, principals of all senior secondary schools should adopt it as part of their administrative style in running day to day activities. The principals should involve every teacher in their administrative activities that will enable students and teachers to perform well in their academic work. There should be good communication channels between principals, teachers and students to ensure academic excellence in the schools.



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### Appendix A

**Table 1.** Mean and Standard Deviation of the Responses of Principals and Teachers Regarding the Impact of Democratic Leadership Style on Student Academic Performance in Agricultural Science in Senior Secondary Schools.

S/N	Items	Principal		Teachers		Grand	R
		$n_p=25$		$n_T=130$		Mean	
		$X_P$	$B_P$	$X_T$	$B_T$	$X_G$	
1	The principal involves every teacher in his administration that enables students to perform well in their academic work.	4.04	1.34	4.53	0.85	4.29	A
2	There is no communication gap between the principal and the agricultural science teachers.	4.56	0.87	4.02	1.23	4.27	A
3	Principal delegate's responsibility to agricultural science teachers which enhance their productivity on student academic work.	4.88	0.33	4.45	0.76	4.67	A
4	Agricultural science teachers participates in decision making which enables them to contribute to curricula matters that enhances students' academic performance in agriculture.	4.40	1.00	4.32	0.93	4.36	A
5	There is regular staff meeting for sharing of ideas on school work.	4.84	0.37	4.25	1.01	4.55	A
6	There is cordial relationship between the principal and agricultural science teachers that help to motivate students to work harder.	4.60	0.87	4.12	1.14	4.36	A
7	The principal make himself accessible to agricultural science teachers on issues regarding students' academic performance.	4.92	0.28	4.28	0.92	4.60	A
8	The principal is just and fair to agricultural science teachers in his administrative decision.	4.44	1.12	3.92	1.36	4.18	A
9	Principal allow for proper interaction between him and agricultural science teachers that influence students' academic work regularly.	3.96	1.57	4.13	1.05	4.05	A
10	The principal ensure regular supervision of work of agricultural science teachers which help to enhance students' academic performance.	4.24	1.30	4.12	1.17	4.18	A
11	The principal recommends agricultural science teachers to attend seminars and workshops in their subject area which help to update teachers' knowledge and skill for improvement of students' academic performance.	4.56	0.92	4.14	1.23	4.35	A
12	The principal share idea together for the smooth running of the school which positively affect students' academic performance.	3.96	1.49	4.28	1.09	4.12	A
<b>Grand Mean</b>		<b>4.45</b>		<b>4.21</b>		<b>4.33</b>	<b>A</b>

#### KEY

$n_p$  = No. of principals  $n_T$  = No. of agricultural science teachers  $X_P$  = Mean score of principals  $X_T$  = Mean score of agricultural science teachers  $B_P$  = Standard deviation score of agricultural science teachers A = Agree  
U = Undecided

### Appendix B

**Table 2.** Mean and Standard Deviation of the Responses of Principals and Teachers Impact of Principals' Autocratic Leadership Style on Students' Academic Performance in Agricultural Science in Senior Secondary Schools.

S/N	Items	Principal		Teachers		Grand	R
		n <sub>P</sub> =25		n <sub>T</sub> =130		Mean	
		X <sub>P</sub>	Б <sub>P</sub>	X <sub>T</sub>	Б <sub>T</sub>	X <sub>G</sub>	
1	The authority of the principal is not felt in the school so agricultural science teachers use the situation to prepare well for their lessons that enhance students' academic achievement.	2.64	1.55	3.67	1.27	3.16	U
2	Our principal is strict in his administration so agricultural science teachers are not encouraged to interact freely with him for improving students' academic performance.	3.96	1.31	3.15	1.23	3.56	A
3	There is only one channel of communication adopted by the principal so agricultural science teachers do not show much interest to discharge their duties to promote students' academic performance.	2.72	1.49	3.18	1.34	2.95	U
4	There is no delegation of authority by the principal.	3.72	1.54	3.09	1.44	3.41	U
5	Principal's decision on most issues is final so agricultural science teachers do gain more experience that helps to improve students' performance.	4.48	1.12	3.83	1.25	4.16	A
6	Principal dominates in most school activities so agricultural science teachers' dedication to duty is high for enhancing students' academic performance.	4.52	1.00	3.69	1.33	4.11	A
7	Agricultural science teachers obey the principal blindly without questioning his administrative style which does not enhance student academic performance.	3.44	1.45	3.45	1.40	3.42	U
8	Principal do not allow agricultural science teachers to contribute to curriculum matters and that affect students' academic performance.	3.64	1.41	3.43	1.50	3.54	A
9	There is no close interaction between agricultural science teachers and principal.	3.48	1.39	3.24	1.22	3.36	U
10	The principal is not flexible with his policies so agricultural science teachers do not do well at work which in turn affects students' academic performance in agricultural science.	3.92	1.19	3.52	1.31	3.72	A
11	The principal has rigid policy on supervision.	3.52	1.58	3.65	1.29	3.59	A
12	Agricultural science teachers find it difficult to approach the principal with their personal problems which affect students negatively.	3.84	1.14	3.00	1.49	3.42	U
13	There is no teacher- principal relationship.	4.28	0.99	3.08	1.57	3.68	A
	<b>Grand Mean</b>	<b>3.63</b>		<b>3.38</b>		<b>3.54</b>	<b>A</b>

### Appendix C

**Table 3.** t-test of Difference Between the Mean Scores of the Responses of Principals and Agricultural Science Teachers on the Impact of Democratic Leadership Style on Student Academic Performance in Agricultural Science in Senior Secondary Schools.

Respondent								
Category	Mean	SD	N	Df	SE	t-cal	t-cri	Remarks
Principals	4.45	0.96	25					
				153	0.16	1.13	1.96	NS
Teachers	4.21	1.06	130					

**Table 4.** t-test of Difference between the Mean Scores of the Responses of Principal and Agricultural Science Teachers on the Impact of Autocratic Leadership Style on Students' Academic Performance in Agricultural Science in Senior Secondary Schools.

Respondent								
Category	Mean	SD	N	Df	SE	t-cal	t-cri	Remarks
Principals	3.63	1.32	25					
				153	0.22	0.86	1.96	NS
Teachers	3.38	1.36	130					

# **TECHNIQUES FOR MOBILISING FARMERS TO EMBARK ON SOIL TESTING FOR ENHANCED FOOD SECURITY IN SOUTH-EAST, NIGERIA**

**Francis Nwangbo Azunku and Victor Emeka Uloh**

## **ABSTRACT**

The study was carried out to identify the techniques for mobilizing farmers to embark on soil testing for enhanced food security in South Eastern, Nigeria. The study adopted descriptive survey research design. The population of the study was 488 made up of 88 lecturers of agriculture in Colleges of Education and 400 Extension Agents from ministries of Agriculture from the five states in South Eastern, Nigeria. All the lecturers were used for the study so no sampling was done for them while stratified sampling technique was used to select 50% of the Extension Agents based on their population in each state and this produced 200. In all a total of 288 was used for the study. The instrument used for collecting data was questionnaire titled Strategies for Mobilizing Farmers in Soil Testing Questionnaire (SMFSTQ). The instrument was developed by the researchers and it was validated by three experts. The instrument was tested for reliability using Kuder-Richardson (K-20) formula and the reliability index was 0.77. The instrument was administered through the help of five research assistants. The instrument was distributed and collected after two weeks and all were returned representing 100% retrieval rate. The data collected were analyzed using Mean, and Standard Deviation to answer the research questions. The results show that the techniques for motivating farmers to embark on soil testing for enhanced food security in South Eastern, Nigeria include the use of media, agricultural practices and computer networking approaches. It was recommended that federal and state ministries of agriculture as well as local government departments of agriculture should adopt the mobilization strategies determined to motivate and encourage farmers to venture into soil testing.

## Introduction

Soil testing is a scientific process of identifying soil type, drainage relations, as well as liming, fertilizer and cropping history of a particular soil. Soil testing is of tremendous assistance in reducing guesswork in lime and fertilizer practices and in helping the farmer to select the needed plant nutrients adequate to correct deficiencies before and after cropping. Soil testing, in the opinion of Hinga (1980) includes a thorough inventory of the soil properties, including primary and secondary minerals, particles size, exchange capacity, adsorbed cation and organic matter. The author added that soil testing consists of biological and chemical analysis that can be used as an index of nutrients available during a cropping season. Soil testing is therefore the analysis of a soil sample to determine nutrient content, composition and other characteristics such as the acidity or pH level. The usefulness of soil testing according to Nnoke (2001) includes that it helps in: evaluating the ability of the soil to sustain good yield; determining specific conditions in the soil which can be improved by the addition of correctives or the introduction of other agricultural practices; predicting the probability of obtaining response to the application of fertilizers; soil classification on the basis of analytical data and for fertilizer recommendations. Other outcomes of soil testing include determining: yield, crops to be grown, the quality of the soil, the real value of soil, and the quality of irrigated water to apply. It also reduces cost of inputs utilized, leads to timeliness of operations and expanded cultivation of marginal lands.

Soil testing will reveal the availability and the quantity of a particular nutrient in a soil sample. The knowledge of the availability and quantity of a particular nutrient in a soil will ensure the farmer knows the type of crop or crops to grow, the type of fertilizer to apply, the time of planting, the type of tillage system to adopt among others. Soil testing must be embraced if food security is to be achieved.

Food security is a state of having a reliable access to a sufficient quantity of affordable nutritious food. It can also be seen as a measure of the availability of food and individual ability to access it for consumption at the right time. Mercy Corps Organization (2015) defined food security as “a development outcome that can be achieved when all people at all times consume sufficient, safe and nutritious food and practice behaviors that promote both their sustainable economic productivity and well being.” United Nation Committee for Food Security (2019) define food security as “a situation where all people at all times have food and economic access to sufficient, safe and nutrition food that meet their food preference and diet needs for an active and healthy life.” It is the importance attached to food security that the United Nations (2016) included food security as goal number two in the Sustainable Development Goals 2016 – 2030. The document specifies that by 2030 it should:

*End hunger and ensure access by all people, in particular the poor and people in vulnerable situations including infants, to safe, nutritious and sufficient food all year round. b. End all forms of malnutrition, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons ...among six others.*

To achieve this goal especially in South Eastern, Nigeria, there is a need for farmers to fully embrace soil testing before planting their crops. Observations and/ experiences of the researchers in South Eastern, Nigeria shows that farmers do not test the soil to determine the index of nutrients available before planting their crop. Also investigations from Federal and State Ministries of Agriculture, Agricultural Development Programmes, Local Government Department of Agriculture and Fadama III Offices in the area of study shows that despite multiple interventions in the agricultural sector, none was directed towards creating awareness in soil testing. This has resulted in many farmers being unable or unwilling to venture into scientific soil testing. To fill the gap, many of the farmers use local experiences like soil type, type of shrubs and elevation of the soil to determine whether the soil is fertile or not before planting their crops.

The use of local experiences in determining the index of nutrients available is not reliable because it cannot reveal the internal content of the soil. For example the type of a particular nutrient present and quantity available cannot be determined. The result is that nutrients are wasted and; crops planted do not germinate. Some plants that germinate do not do well, while in other cases, nutrients are applied in soil that already have enough, which makes the crop end up in vegetative growth, thereby producing little or no food for the farmer. This situation is very worrisome as both commercial and subsistence farmers do not test their soil before planting their crop. To find solutions to the problem, the researchers interviewed some of the farmers on why they do not practice scientific soil testing. The reasons deduced include: inadequate techniques and knowledge of soil testing, as well as inadequate awareness of the need to test soil before planting of crops.

These reasons made the researchers consider of possible solutions to the problems and one of the solutions identified was creating awareness of soil testing among farming communities through mobilization. Hornby (2010) defined mobilization as “the process of organizing, gathering or assemblage of a group of people to venture into a new programme.” It can also be seen as a process by which a group goes from being a passive collection of individuals to an active group that is ready to work. According to Iwena (2017) “Mobilization makes one get ready for action”. Olaitan, S. O. (2005), noted that for farmers to embrace new technology in agriculture generally they need to be properly informed through the use of the media, agricultural practices, and computer networking. Therefore for farmers in South Eastern, Nigeria to increase the productivity of all the crops they grow so as to achieve sustainable development goal number two (2) which is food security for all, they need to be mobilized to venture into soil testing. Since the techniques to be used by the stakeholders for this mobilization programme were not yet known, the study therefore aimed to determine the techniques for mobilizing farmers to embark on soil testing for enhanced food security in South Eastern, Nigeria.

### **Purpose of the Study**

The general purpose of the study is to determine the techniques for mobilizing farmers to

embark on soil testing for enhanced food security in South Eastern, Nigeria. Specifically the study sought to:

- a. Determine the media approaches that would be adopted to mobilize farmers to embark on soil testing in South Eastern, Nigeria.
- b. Determine the agricultural practices that would be adopted to mobilize farmers to embark on soil testing in South Eastern, Nigeria.
- c. Determine the computer networking approaches that would be adopted to mobilize farmers to embark on soil testing in South Eastern, Nigeria.

### **Research Questions**

The following research questions guided the study.

- a. What are the media approaches that would be adopted to mobilize farmers to embark on soil testing in South Eastern, Nigeria?
- b. What are the agricultural practices that would be adopted to mobilize farmers to embark on soil testing in South Eastern, Nigeria?
- c. What are the computers networking approaches that would be adopted to mobilize farmers to embark on soil testing in South Eastern, Nigeria?

### **Methodology**

The study adopted descriptive survey research design. Descriptive survey design according to Nworgu (2015), is one in which a group of people is studied by collecting and analyzing data from a few people considered to be a representative of the entire group. The author further stated that questionnaire, test or interview could be used to collect data in descriptive survey design. In this study, a questionnaire was used to obtain data from lecturers of agriculture in Colleges of Education and Extension Agents working in Ministries of Agriculture in the five states that make up South Eastern, Nigeria.

The questionnaire was divided into three sections. Section one addressed the media approaches that would be adopted to mobilize farmers to embark on soil testing. Section two addressed the agricultural practices that would be adopted to mobilize farmers to embark on soil testing in South Eastern, Nigeria, Section three addressed the computer networking approaches that would be adopted to mobilize farmers to embark on soil testing.

The response options of the items in the questionnaire were Highly Required (HR), Averagely Required (AR), Slightly Required (SR) and Not Required (NR) with corresponding value of 4, 3, 2 and 1. The population of the study was 488 made up of 88 lecturers and 400 Extension Agents working in Ministries of Agriculture in the five states that make up South Eastern, Nigeria. All the lecturers were used for the study so no sampling was done for them while a stratified sampling technique was used to select 50% of the Extension Agents working in



Ministries of Agriculture in the five states based on their population in each state and this produced 206. In all, a total of 288 respondents completed the questionnaire. The instrument used for collecting data was a questionnaire titled Strategies for Mobilizing Farmers in Soil Testing Questionnaire (SMFSTQ). The instrument was developed by the researchers and it was validated by three experts in Agricultural Extension from the Faculty of Agriculture at Alex – Ekwueme Federal University, Ikwo, Ebonyi State. The instrument was tested for reliability using Kuder-Richardson (K-20) formula and the reliability index was 0.77. The instrument was administered through the help of five research assistants one in each state. All the instruments were distributed and collected after two weeks and all were returned representing 100% retrieval rate. The data collected was analyzed using Mean and Standard Deviation to answer the research questions. Using standard deviation, any mobilization item that was less than 1.96 was accepted because it shows that the respondents were not too far from the mean and they were close to one another in the responses. These items were used to make recommendations.

## Results

### Research Question 1

What were the media approaches that would be adopted to mobilize farmers to embark on soil testing in South Eastern, Nigeria?

**Table 1.** Mean Ratings of Responses of Lecturers of Agricultural Education in the Colleges of Education and Extension Agents from Ministries of Agriculture on the Media Approaches that would be adopted to mobilize farmers to embark on soil testing in South Eastern Nigeria.

**N =288**

S/No	Media approaches that would be adopted to mobilize farmers to embark on soil testing	-X	SD	Remarks
1.	Use of bill boards	3.37	0.57	Required
2.	Use of posters	3.04	0.98	Required
3.	Use of television	3.39	0.91	Required
4.	Use of newspapers	2.93	0.93	Required
5.	Use of flairs	3.25	0.93	Required
6.	Use of magazines	2.96	0.84	Required
7.	Use of newsletters	3.45	0.50	Required
8.	Leaflets	3.05	0.85	Required
9.	Use of pamphlets	3.12	0.54	Required
10.	Use of news bulletins	2.95	0.85	Required
11.	Projected visuals/film shows or videos	3.11	0.49	Required
12.	Exhibitions	3.09	0.45	Required
13.	Use of proceedings/journals	2.94	0.55	Required

The data presented in table 1 reveals that the 13 mobilization items had mean values ranging from 2.93 to 3.70. This means that each mean value is above the cutoff point of 2.55, indicating that they are all required by farmers in South Eastern Nigeria for effective participation in soil testing for food security.

The standard deviations ranged from 0.46 to 0.96. This means that each of the standard deviations is below 1.96. It therefore shows that all the respondents were close to the mean and were also close to one another in their responses.

## **Research Question 2**

What are the agricultural practices that could be adopted to mobilize farmers to embark on soil testing in South Eastern, Nigeria?

**Table 2:** Mean Ratings of Responses of Lecturers of Agricultural Education in the Colleges of Education and Extension Agents from Ministries of Agriculture on the Agricultural Practices that would be adopted to mobilize farmers to embark on soil testing in South Eastern Nigeria.

**N =288**

S/No	<i>Agricultural practices that would be adopted to mobilize farmers to embark on soil testing in South Eastern, Nigeria</i>	-X	SD	Remarks
14	Instituting award for the best farmer	3.64	0.62	Required
15	House to house visit	3.65	0.48	Required
16	Visiting village play grounds	3.60	0.54	Required
17	Joining community meetings to educate farmers	3.58	0.67	Required
18	Government directives	3.48	0.54	Required
19	Visiting farm settlement schemes	3.52	0.50	Required
20	Use of farmer education clinics	3.53	0.50	Required
21	Use of demonstration farms	3.32	0.60	Required
22	Government programmes	3.44	0.62	Required
23	Use of subsidy	3.25	0.72	Required
24	Use of cooperative societies	3.55	0.62	Required
25	Use of group work	2.67	0.46	Required
26	Use of Agricultural support programmes	3.31	0.69	Required
27	Use of cluster farming	3.00	0.45	Required
28	Offer of expatriate advise by extension agents	2.80	0.46	Required
29	Use of demonstration farms	3.55	0.10	Required
30	Adult education	3.70	0.30	Required
31	Provision of insurance cover for farmers fearing to venture in soil testing	2.78	0.43	Required
32	encouraging the formation of farmers soil testing clubs	2.96	0.48	Required
33	Establishment of farmers interest groups	2.90	0.48	Required
34	Organizing agricultural shows/exhibition on results of soil testing	3.00	0.40	Required
35	Granting credit facilities for the purchasing of soil testing equipment	3.10	0.40	Required
36	Training farmers on soil testing techniques	3.44	0.62	Required
37	Provision of consultancy services	3.53	0.50	Required

The data presented in table 2 reveals that the 25 mobilization items in research question 2 had mean values ranging from 2.78 to 3.65. Each mean value is above the cutoff point of 2.55, this

indicates that they are all required for mobilizing farmers in South Eastern, Nigeria for them to embark effectively in soil testing in the five states.

The standard deviation ranged from 0.40 to 0.72. This means that each standard deviation is below 1.96. It therefore shows that the respondents are close to the mean and were also close to one another in their responses.

### Research Question 3

What are the computers networking approaches that would be adopted to mobilize farmers to embark on soil testing in South Eastern, Nigeria?

**Table 3:** Mean Ratings of Responses of Lecturers of Agricultural Education in the Colleges of Education and Extension Agents from Ministries of Agriculture on the Computer Networking Approaches that would be adopted to mobilize farmers to embark on soil testing in South Eastern Nigeria.

**N =288**

S/No	<i>Computers networking approaches that would be adopted to mobilize farmers to embark on soil testing</i>	-X	SD	Remarks
38	Use of Facebook	3.64	0.62	Required
39	Use of WhatsApp	3.65	0.48	Required
40	Use of blogs	3.60	0.54	Required
41	Use of YouTube	3.58	0.67	Required
42	Use of Instagram	3.48	0.54	Required
43	Use of e-marketing	3.52	0.50	Required
44	Use of e-conferencing	3.53	0.50	Required
45	Use of computer games	3.32	0.60	Required
46	Use of Websites	3.44	0.62	Required
47	Use of Internets	3.25	0.72	Required
48	Use of Myspace	3.55	0.62	Required
49	Use of Google mail	3.63	0.61	Required
50	Use of LinkedIn	3.64	0.48	Required
51	Use of Yahoo mail	2.66	0.46	Required
52	Use of messenger	2.51	0.41	Required

The data presented in table 3 reveals that the 15 mobilization items in research question 3 had mean values ranging from 2.51 to 3.65. This means that each mean value is above the cutoff point of 2.55, indicating that all the Computers Networking Approaches would need to be adopted to mobilize farmers to embark on soil testing in South Eastern, Nigeria.

The standard deviation ranged from 0.41 to 0.72. This means that each standard deviation is below 1.96. It therefore shows that the respondents were close to the mean and were also close to one another in their responses.

### **Summary of Findings**

The findings on research question 1 show that the respondents accepted the following as the mobilization strategies to be adopted to encourage farmers to venture into soil testing: bill boards, posters, television, newspapers, newspapers, flairs, magazines, newsletters, leaflets, pamphlets, news bulletins, visuals/film shows or videos and exhibitions

The findings on research question 2 shows that the respondents accepted the following as the mobilization strategies to be adopted using agricultural practices to encourage farmers to venture into soil testing: an award for the best farmer, house to house visit, visiting village playgrounds, joining community meetings to educate farmers, government directives, visiting farm settlement schemes, use of farmer education clinics, use of demonstration farms, government programmes, subsidies, cooperative societies, group work, agricultural support programmes, cluster farming, expatriate advice by extension agents, demonstration farms, adult education, insurance cover for farmers fearing to venture into soil testing, encouraging the formation of farmers soil testing clubs, establishment of farmers interest groups, organizing agricultural shows/exhibition on results of soil testing, granting credit facilities for the purchasing of soil testing equipment, training farmers on soil testing techniques and provision of consultancy services.

The findings on research question 3 shows that the respondents accepted the following as the mobilization strategies to be adopted using computer networking approaches to encourage farmers to venture into soil testing: Facebook, WhatsApp, blogs, YouTube, Instagram, e-marketing, e-conferencing, computer games, websites, internet, Myspace, Google mail, LinkedIn, Yahoo mail and messenger.

### **Recommendations**

Based on the findings of the study the following were recommended for implementation:

- a. Federal and State Ministries of Agriculture as well as Local Government Departments of Agriculture should adopt the mobilization strategies determined by the study to train farmers on the skills of soil testing.
- b. Non - governmental organizations should assist in the re-training of farmers in soil testing.

- c. Extension agents should be re-trained and equipped with necessary skills in soil testing so that they can teach farmers.
- d. The prices of soil testing equipment should be subsidized by governments and non-governmental organizations so that farmers can buy them.
- e. The findings of the study should be used by interested individuals and groups to organize workshops, seminars and short duration courses for farmers.

### **Conclusion**

This study identified the ways of mobilizing farmers to embark on soil testing in South Eastern, Nigeria. The 288 respondents used for collecting data unanimously accepted the items presented as the mobilization strategies that would be adopted to encourage farmers to venture into soil testing and analysis. It was recommended that the findings of the study should be used to organize workshops, seminars and short duration courses as a way of mobilizing farmers to embark on soil testing among others.

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# THE IMPACT OF POVERTY ALLEVIATION PROGRAMS ON WOMEN EMPOWERMENT IN NORTH-CENTRAL STATES, NIGERIA

Agada Ameh Michael, Bridget Lawani, and Anongo Febian Hon

## ABSTRACT

The struggle against poverty has been a development plan in Nigeria from independence till date. Successive government's interventions programs on poverty alleviation have not been able to achieve the desired objectives for which they were established. It is against this background that the paper examined poverty alleviation and women empowerment programs in North-Central States of Nigeria. The study employed and secondary data which were obtained through the administration of structured questionnaire, data was collected from 330 respondents, these include women that are applicant, full time house wives, petty traders, low and middle class workers in North-Central States of Nigeria. The study found that the poverty alleviation programs is working towards the eradication of extreme poverty and hunger, the promotion of gender equality and the empowerment of women in North-central States of Nigeria. The empowering programs have contributed immensely towards poverty alleviation by financing women. Some of its contributions have not had the desired impact due to internal and external constraints like: inadequate and untimely release of funds by the government; inadequate/inappropriate staffing; inability to monitor the impact and performance of beneficiaries due to logistics problems; massive unemployment among women. The study recommended that institutional arrangements to enhance the status of women and increase their access to education to create awareness and strengthen the zeal for entrepreneurship.

**Keywords:** poverty, alleviation: women, empowerment



## Introduction

In Nigeria, successive governments either military or democratic have formulated and implemented diverse policies, plans and programs aimed at reducing or alleviating poverty. Uduakobong (2015) asserted that successive governments in Nigeria over the years, have initiated and implemented diverse policies and programmes as part of their development strategies aimed at poverty reduction and explained further that despite these efforts, the incidence of poverty persists, unemployment rate increased and the human development.

An index ranking of 0.504 in 2013 placed the nation at 152 out of 187 countries surveyed worldwide, and 22 out of 52 countries surveyed in Africa United Nations Development Programme (UNDP,2014). However, Uma and Eboh, (2013), points out that poverty in African countries is massive, pervasive and chronic, engulfing a large proportion of the society. This is to say human conditions in our society have deteriorated badly to the extent that real disposable incomes dwindled, increase in crime rate, kidnapping, activities of the insurgence (Boko Harm) and increase in malnutrition rates.

Aiyedogbon and Ohwofasa (2012) emphasized that the situation is more critical considering that in spite of the vast resources committed to poverty alleviation by every successive administration; no obvious achievement has been accomplished in this direction. Poverty is a deadly virus which affects people all over and is generally regarded as one of the manifestations of underdevelopment all over the world. Poverty is a global phenomenon, which affects continents, nations and peoples differently. It afflicts people in various depths and levels, at different times and phases of existence. Careful observation from above leads to the following questions what is poverty?, what is the effectiveness of poverty alleviation? How can it used for the Promotion of gender equality? What is the Contribution of poverty alleviation? and what are the internal and external constraints?, Which this paper intends to provide answers.

Poverty in a way is difficult to give it a universal definition, due to the fact that many aspects of human conditions are greatly affected. But on a general note poverty can be described as a condition in which people live below a minimum income level and are unable to provide the basic needs of life. Aderonmu (2010), defined poverty as lack of command over basic consumption needs.

The Central Bank of Nigeria (2011) views poverty as “a state where an individual is not able to cater adequately for his or her basic needs of food, clothing and shelter; unable to meet social and economic obligations, lacks gainful employment, skills, assets and self-esteem; and has limited access to social and economic infrastructure such as education, health, portable water, and sanitation. Consequently, one has a limited chance of advancing his or her welfare to an acceptable standard.

Webster’s Dictionary described poverty from two different perspectives first from the angle of lack of money or lack of power. Lack of money means an insufficiency in cash and inadequacy of resources to provide all types of basic human needs such food, water, shelter, education, health, jobs and security of life, while lack of power refers to lack of opportunity and choices to control forces and persons outside their control especially people in positions of authority. This

show that Poverty takes away human right and affect people whether men or women an subjecting the individual to a state of powerlessness. Again World Bank (2011) defines poverty as a condition of life degraded by diseases, depravation and equator.

Chen and Ravillion (2010) point out that, poverty is a situation where the resources of individuals or families are inadequate to provide a socially acceptable standard of living. This affirms the situation where majority of the population are not able to meet the basic needs of life due to poverty. It dehumanizes and humiliates its victims and denying them access to the basic needs of life but also excluding them from goods, services and activities which constitutes the basis of citizenship. Tinuke (2012) points out that poverty is a threat that no country disregards because of its effects on human development. Poverty remains a major hindrance to human development worldwide especially in developing countries such as Nigeria. Therefore there is every need to bring in measures for alleviation of poverty which is empowerment especially women in North-Central States.

Empowerment has no precise definition but, in the simplest form, it refers to the practice of sharing information, rewards, and power with the less privilege, the powerless or employees whether man or woman so that they can take initiative and make decisions to solve problems and improve service and performance. Empowerment is based on the idea that giving less privilege, the powerless or employees skills, resources, authority, opportunity, motivation, as well holding them responsible and accountable for outcomes of their actions, will contribute to their competence and satisfaction. Other contributor to the definition of empowerment include Asabe and Jimjel (2014), who defined it as the process that allows one to gain the knowledge, skill-sets and attitude needed to cope with the changing world and circumstances in which one lives. Adeoti and Popoola (2012) described empowerment in general terms to mean a process by which powerless people become conscious of their own situation and collectively organize themselves to gain greater access to public services or the benefits of economic growth.

Empowerment is instrumentally important for achieving development outcomes and well-being of life which lies in the doing and being what one value and have reason to value. World Bank and the United Nations as a prominent advocated of Women's empowerment described empowerment as an important channel for improving child health, increasing school enrolment, reducing gender disparity, poverty, promoting growth and better governance.

### **Statement of the Problem**

Poverty alleviation and women's empowerment in North-Central States, Nigeria face a lot of challenges thereby not making meaningful impact on women in this area. Some of this challenge includes effectiveness of poverty alleviation, promotion of gender equality, contribution of poverty alleviation to the women and other internal and external constraints. The problem is that, the huge amount of money spent on this program only succeeded in deepening poverty thereby multiplying the number of persons falling into that category instead of moving out of poverty. Based on the foregoing, this research investigates the impact of poverty alleviation programs on women empowerment in North-Central States, Nigeria This

also study examines the efforts made by various governments in North-Central States, Nigeria to reduce poverty among the women as to ascertain the effectiveness of programmes.

### **The Objectives**

The general objective of this research is The Impact of Poverty Alleviation programs on Women empowerment in North-Central States, Nigeria. The specific objectives of the study include:

- a. to examine the effectiveness of poverty alleviation adopted in empowering women in North-Central States.
- b. to highlight some contribution of poverty alleviation to women in North-Central States
- c. to highlight some internal and external constraints poverty alleviation in North-Central States

### **Research questions**

1. What is the Effectiveness of poverty alleviation program adopted in empowering women in North-Central States?
2. What is the Contribution of poverty alleviation program to women in North-Central States?
3. What are internal and external constraints of poverty alleviation program in North-Central States?

### **Research hypothesis**

**H<sub>01</sub>:** There is no significant difference in the mean response scores of Applicant and Civil Servants all women on effectiveness of poverty alleviation program in North-Central States.

**H<sub>02</sub>:** There is no significant difference in the mean response scores of women Applicant and women Civil Servants on Contribution of poverty alleviation program in North-Central States.

**H<sub>03</sub>:** There is no significant difference in the mean response scores of women Applicant and women Civil Servants on internal and external constraints of poverty alleviation program in North-Central States.

## Methodology

A descriptive survey research design was used in this study. The researchers considered this design appropriate since no variable was manipulated in this study. The population study comprised three hundred and thirty (330) women that is 167 women applicant and 163 women Civil Servants in North-Central States of Nigeria. Benue, Kogi, Kwara, Niger, Plateau, Nasarawa States belongs to North-Central States of Nigeria and it is located between latitude  $10^{\circ}19'60''$  N and longitude  $7^{\circ}45'0''$  E of prime meridian: no sample for the study was take as the population is of manageable size. Data were collected using a developed questionnaire titled Impact of Poverty Alleviation programs on Women empowerment Questionnaire (IPAPWEQ). The instrument (IPAPWEQ) was divided into three sections A, B, and C. The questionnaire is divided into three sections and each section tests the research questions. Section A' has ten (10) item questions, section B' has twelve (12) item question and section C' has. ten (10) item Question. The response format of (IPAPWEQ) was based on a modified four-point scale pattern of Strongly Agree (SA=4), Agree (A=3), Disagree (D=2) and Strongly Disagree (SD=1). Any item whose mean value is 2.50 and above was regarded as Agreed while below 2.50 was regarded as disagreed.

### Validation /Reliability

The instrument was content and face validated by three experts from the Department Vocational and Technology Education, Abubakar Tafawa Balewa University, Bauchi State in Nigeria before being used for data collection. The reliability of the instrument was determined using Cronbach's Alpha and reliability coefficient of 0.87 was calculated.

### Data Collection and Analysis Technique

A total of three hundred and thirty (330) copies were administered to the respondents, 330 were completed and retrieved back which represent 100% return. Mean score was used to analysis data from the research questions where the cutoff point is 2.50.

## Results

Mean and standard deviation was used for answering the research questions based on a four-point modified rating scale of 1, 2, 3, 4 respective. This means any item with mean score of 2.50 and above was regarded as agree while any item with mean score of less than 2.50 were regarded as disagree.

**Research question one:** What is the effectiveness of poverty alleviation program adopted in empowering women in North-Central States?

The result from effectiveness of poverty alleviation program adopted in empowering women in North-Central States as was presented in Table 1. Show Mean response scores of respondents

on effectiveness of poverty alleviation program adopted in empowering women in North-Central States.

**Table 1.** **N=330**

S/No.	Questionnaire Item Statement	$\bar{X}$	SD	Remark
<i>Creation of</i>				
1.	Micro Small and Medium Enterprise	3.75	0.43	strongly Agree
2.	Development Fund	3.13	0.83	strongly Agree
3.	Microfinance Policy	3.49	0.77	strongly Agree
4.	Regulatory and Supervisory Framework	2.79	0.89	Agree
5.	Financial literacy	2.78	0.81	Agree
6.	Family Support Programme (FSP)	3.13	0.83	strongly Agree
7.	Skills acquisition centres	3.75	0.43	strongly Agree
8.	Industrial Training Programme (ITP)	3.70	0.46	strongly Agree
9.	Awareness/enlightenment	2.66	0.90	Agree
10.	Entrepreneurial training	2.81	1.02	Agree

*Symbols keys:*  $\bar{X}$  = Mean score, SD = Standard Deviation, N= Numbers of respondent

Table 1 shows that, the respondents strongly agreed on six (6) items which are 1, 2, 3, 6, 7, 8, while the respondents also agreed on four (4) items which are 4, 5, 9 and 10 bringing the total numbers to 10 items in section A. With mean values of between 2.66 and 3.78 all these items mean values were high and within the real limit of numbers 2.50 - 4.00. indicating that the items are in agreement with effectiveness of poverty alleviation program adopted in empowering women in North-Central States.

**Research question 2:** What is the Contribution of poverty alleviation program to women in North-Central States?

The result from contribution of poverty alleviation program to women in North-Central States as was presented as in Table 2: show the Mean response scores of respondents on Contribution of poverty alleviation program to women in North-Central States

Table 2: shows that, the respondents the agree on eight (8) items which are 11, 12, 13,14, 15, 16, 17, and 18 bringing the total numbers to 8 items in section B. With mean values of between 2.67 and 2.94 all these items mean values were high and within the real limit of numbers 2.50-4.00 indicating that the items are in agreement with contribution of poverty alleviation program to women in North-Central States.

**Table 2.** **N=330**

S/No.	Questionnaire Item Statement	$\bar{X}$	SD	Remark
	<i>Provision of</i>			
11.	Short term skills acquisition and training programmes for women.	2.86	0.83	Agree
12.	Skills acquisition/vocational training centres	2.85	0.74	Agree
13.	Non- fee paying training programmes	2.68	0.97	Agree
14.	Economic empowerment programme	2.67	0.70	Agree
15.	Level of well-being of these women	2.72	0.61	Agree
16.	Women's representation in decision-making	2.67	0.97	Agree
17.	Reduce infant and child mortality by two-thirds	2.92	0.64	Agree
18.	Progress toward gender equality and the empowerment of women	2.94	0.71	Agree

**Research question 3:** What are internal and external constraints of poverty alleviation program in North-Central States?

Results from internal and external constraints of poverty alleviation program in North-Central States as was as presented in Table3: show Mean response scores of respondents on internal and external constraints of poverty alleviation program in North-Central State.

**Table 3.**

S/No.	Questionnaire Item Statement	$\bar{X}$	SD	Remark
<i>Internal and external constraints of poverty alleviation</i>				
19	Culture and tradition beliefs.	2.86	0.83	Agree
20	Accessing health facilities.	2.85	0.74	Agree
21	Gender discrimination.	2.68	0.97	Agree
22	Inadequate Funding/ untimely release of funds.	2.67	0.70	Agree
23	Political factors.	2.72	0.61	Agree
24	Gender based violence.	2.67	0.97	Agree
25	Norms allocating care work to women.	2.92	0.64	Agree
26	Logistics problems.	2.94	0.71	Agree
27	Unemployment among women.	3.03	0.69	Strongly Agree
28	Competency Challenges on Political Problem.	3.00	0.68	Strongly Agree

Table 3: shows that, the respondents strongly agree on two (2) items which are 27 and 28, while the respondents also agree on eight (8) items which are 19, 20, 21, 22, 23, 24, 25 and 26 bringing the total numbers of items to 10 items in section C. With mean values of between 2.67 and 3.03 all these items mean values were high and within the real limit of numbers 2.50-4.00 indicating that the items are in agreement with internal and external constraints of poverty alleviation program in North-Central State

### Testing of Hypotheses

**Hypothesis 1:** There is no significant difference on the mean responses of applicant and civil servants all women on contribution of poverty alleviation program in North-Central States. The data for testing hypothesis 1 as was presented in Table 4. Show the *t*-test analysis of the mean ratings of responses of applicant and civil Servants women on contribution of poverty alleviation program in North-Central States.

**Table 4.**

S/No.	Questionnaire Item Statement	N=167		N=163		t-Cal	Remark
		$\bar{X}_1$	SD <sub>1</sub>	$\bar{X}_2$	SD <sub>2</sub>		
<i>Creation of</i>							
1.	Micro Small and Medium Enterprise	3.75	0.469	3.60	0.707	1.183	not significant
2.	Development Fund	3.13	0.845	3.20	0.678	-0.818	not significant
3.	Microfinance Policy	3.49	0.559	3.50	0.509	-0.856	not significant
4.	Regulatory and Supervisory Framework	2.79	0.822	3.04	0.888	-0.737	not significant
5.	Financial literacy	2.78	0.574	2.64	0.553	-1.007	not significant
6.	Family Support Programme (FSP)	3.13	0.558	3.08	0.640	-0.264	not significant
7.	Skills acquisition centres	3.75	0.469	3.60	0.707	1.183	not significant
8.	Industrial Training Programme (ITP)	3.70	0.452	3.80	0.408	1.649	not significant
9.	Awareness/enlightenment	2.66	0.881	2.88	0.881	1.246	not significant
10.	Entrepreneurial training	2.81	0.864	2.48	0.875	1.654	not significant

**Key:**

X1 = Mean of women Applicant

X2 = Mean of women Applicant

SD1 = Standard Deviation of women Civil Servants

SD2 = Standard Deviation of women Civil Servants

DF = Degree of Freedom (167 + 163 = 330 – 2 = 328)

t- Table (critical) value = 1.96

Level of Significance = 0.05

Data presented in Table 4: revealed that responses of women applicant and women civil Servants had their calculated *t*-values ranged from - 0.264 to 1.654 which were less than *t*-table value of 1.96 (two tailed test) at  $P \leq 0.05$  level of significance and at 328 degree of freedom (df). This indicated that there were no significant differences in the mean ratings of the responses of the two groups of respondents (applicant and civil Servants) on contribution of poverty alleviation program. Therefore; the null hypothesis of no significant difference in the mean ratings of the responses of the two groups of respondents on the 10 items was upheld.

**Hypothesis 2:** There is no significant difference in the mean response scores of women applicant and women civil servants on internal and external constraints of poverty alleviation program in North-Central States as was presented in Table 5: show the *t*-test analysis of the Mean ratings of the responses of women applicant and women civil servants on internal and external constraints of poverty alleviation program in North-Central States.



**Table 5.**

S/No.	Questionnaire Item Statement	N=167		N=163		t-Cal	Remark
		$\bar{X}_1$	SD <sub>1</sub>	$\bar{X}_2$	SD <sub>2</sub>		
<i>Internal and external constraints of poverty alleviation</i>							
19.	Culture and tradition beliefs	2.86	0.822	3.04	0.888	-0.737	not significant
20.	Accessing health facilities	2.85	0.822	3.04	0.888	-0.737	not significant
21.	Gender discrimination	2.68	0.864	2.48	0.875	1.654	not significant
22.	Inadequate Funding/ untimely release of funds	2.67	0.700	2.48	0.653	0.398	not significant
23.	Political factors	2.72	0.839	2.88	0.881	-1.097	not significant
24.	Gender based violence	2.67	0.794	2.84	0.553	-1.372	not significant
25.	Norms allocating care work to women	2.92	0.700	3.32	0.627	-1.283	not significant
26.	Logistics problems	2.94	0.831	2.76	0.830	0.705	not significant
27.	Unemployment among women	3.13	0.558	3.08	0.640	-0.264	not significant
28.	Competency Challenges on Political Problem	3.03	0.845	2.96	0.888	0.346	not significant

Data presented in Table 5 above revealed that responses of Women Applicant and Women Civil Servants had their calculated t-values ranged from -0.264 to 1.654 which were less than t-table value of 1.96 (two tailed test) at  $P \leq 0.05$  level of significance and at 328 degree of freedom (df). This indicated that there were no significant differences in the mean ratings of the responses of the two groups of respondents (applicant and civil Servants) on Contribution of poverty alleviation program. Therefore; the null hypothesis of no significant difference in the mean ratings of the responses of the two groups of respondents on the 10 items was upheld.

### Discussion of Finding

The finding from table I: reveals that the respondents strongly agree on six (6) items these are Micro Small and Medium Enterprise, Development Fund, Microfinance Policy, Regulatory and Supervisory Framework, Financial literacy and Family Support Programme, while the respondents also agree on four (4) items which are skills acquisition centres, awareness/enlightenment, industrial training programme and entrepreneurial training, bringing the total numbers to 10 items, with mean values of between 2.66 and 3.78 all these items mean values were high and within the real limit of numbers 2.50 - 4.00 indicating that the items are in agreement with effectiveness of poverty alleviation adopted in empowering women in North-Central States.

The findings from table 3 indicate that the respondents agree on eight (8) items which are short term skills acquisition and training programmes for women, skills acquisition/vocational

training centres, Non- fee paying training programmes, economic empowerment programme, level of well-being of these women, women's representation in decision-making, reduce infant and child mortality by two-thirds and Progress toward gender equality and the empowerment of women bringing the total numbers to 8 items in section C, with mean values of between 2.67 and 2.94 all these items mean values were high and within the real limit of numbers 2.50-4.00. indicating that the items are in agreement with contribution of poverty alleviation to women in North-Central States.

The findings from table 3 indicate that the respondents strongly agree on two (2) items which are Unemployment among women and Political Problem while the respondents also agree on eight (8) items which are Culture and tradition beliefs, Accessing health facilities, Gender discrimination, Inadequate Funding/ untimely release of funds, Political factors, Gender based violence, Norms allocating care work to women and Logistics problems Challenges bringing the total numbers to 10 items in section C, with mean values of between 2.67 and 3.03 all these items mean values were high and within the real limit of numbers 2.50-4.00. indicating that the items are in agreement with internal and external constraints poverty alleviation in North-Central States.

### **Conclusion**

Based on the findings of the study, it can be concluded that The Impact of Poverty Alleviation programs on Women empowerment in North-Central States, Nigeria is very important as most item on table 1 strongly agree and agree that all the items are in Effective adopted for poverty alleviation and in empowering women in North-Central States, Also certain items were strongly agree and agree upon in table 2 as Contribution of poverty alleviation to women in North-Central States.

### **Recommendations**

The following recommendations were made based on the result of the study.

1. Status of women should be strengthened to increase access to education, as access to education by women will remove the notion of women being good at kitchen, child bearing poverty reduction and will be empowered academically.
2. Government should formulate policies against discrimination of women, this policy will empower women not to be afraid of getting education, rather to punish parents and guardians who fail to give education to them.
3. Women should be enhanced to participate in nation building. This will reduce women dependent on the men, as in every 100% of activities of nation building women should be allowed 50%. This will enhance women participate in nation building and poverty reduction.

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# THE ROLE AND CHALLENGES OF MICRO SMALL AND MEDIUM SCALE BUILDING CONSTRUCTION ENTERPRISES IN BOOSTING THE NIGERIAN ECONOMY FOR SUSTAINABLE DEVELOPMENT

Dauda Gana and T.J.Tika

## ABSTRACT

This study determined the role and challenges of micro small and medium scale building construction enterprises in boosting the Nigerian economy. Three purposes and three research questions were formulated to guide the study. Survey research design was adopted for getting opinions from the target population. The populations of the study consist of site clerks, contractors and estate developers randomly sampled to a sample size of 60 respondents. This is made up of 20 site clerks, 20 contractors and 20 estate developers. A 42 items structured questionnaire on 4 point scale was developed and used as instrument for data collection. The entire instruments administered were collected back. The method of data analysis adopted was mean and standard deviation and the decision rule was based on the average of the 4 point scale which is 2.50. The findings of the study identified the roles and challenges of small and medium scale building construction and some strategies for improving the role of small and medium scale businesses were determined which include: the provision of adequate funding accessible for entrepreneurs, by creating a conducive atmosphere to encourage the development and growth of building construction enterprises in Nigeria. One of the recommendations made was, to emphasize, support, and facilitate the role of small and medium scale building construction enterprises in the development of the economy by relevant authorities and stakeholders in Nigeria.

**Keywords:** Economic, Strategies, Sustainable, Enterprise, Development.

## Introduction

Micro Small and Medium Scale Enterprises (MSMSE) generally is a strong hold for economic growth through numerous activities, providing job opportunities that are created for various skilled and unskilled human resources in every community. Small industry is defined by Shita (2001) as any industry which is independently owned and operated and not dominos in its area of operation. A small business requires at most one man who is committed to the business through financial, human and material resources management. In small scale business the head of operation knows every one closely because it is made up of few persons, and most responsibility is taken by the head without much consultation.

According to Ojemba (2000) small enterprises has some characteristics that distinguishes it from large enterprise which include: sole ownership of business, operates locally, small capital base provided by the owner of the business, who has a strong sense of enterprise, managed and controlled by the owner who has high value for time and expects quick and concrete results.

It is reported by Ezinwa (2018) that small and medium scale business accounts for over 80 percent of the enterprises in the world and is responsible for 50 to 60 percent of employment in Nigeria. This shows that small and medium scale enterprise is a major factor for socio-economic advancement that requires the creation of suitable atmosphere for sustainability.

The building construction industry has a lot of areas of such interest where small scale enterprises are established and are effectively providing job opportunities for the teaming population of skilled and unskilled human resources. These areas include; concrete production, block laying, purchase and supply of building equipment, design and construction of buildings, whole sale distribution and consultancy services. Any of these and many more aspects can form a viable enterprise with so much benefit to the community and the economy of the country.

Umaru (2016) in his study on the trends and challenges of small and medium scale business in Nigeria reported that over 55 percent of employment is provided by small and medium scale businesses despite the numerous challenges bedeviling the sector. It was discovered by Joab (2016) that the major challenge of the sector is poor management of resources, which has serious negative impact on the growth of small and medium scale businesses in Nigeria. The owners of small enterprises don't have the required management skills to apply for adequate resource management of their enterprise. The inadequate skills for financial and human resources management for example is the reason for rise and fall experienced by most small and medium scale enterprises in Nigeria. Some of the lapses that led to the failure of identified by Bello (2010) include the monopoly of control and authority exerted by the owners of the businesses on resources, for instance, having no bank account as an enterprise or bank with only one signatory and decisions are taken without consultation, in most cases the resources are not utilized for the growth of the business rather the interest of one person.

Considering the important role of small and medium scale to economic development Ilijah (2002) emphasize that businesses is best registered with corporate affairs and be professionally organized in operation to avoid the risks that leads to retardation and failure. He concluded that small and medium scale enterprises are one of the driving forces for socio-economic growth

and development of the nation. Unfortunately, the inadequate access to finance continues to be one of the significant impediments to the creation, survival, and growth of small scale businesses in Nigeria.

Jeffry (2015) suggested that small scale businesses need a robust financing to meet needs at each stage of the enterprise life style. There should be easy access to loan facilities at low interest rate of at least one percent like most developed economies of the world and the right atmosphere for SMES to thrive should not be disputed.

### **Statement of the Problem**

Building construction has variety of micro small and medium scale businesses in operation that contribute in no small measure to the growth of Gross Domestic Products (GDP) of Nigeria. However, it is observed that there are challenges in this area that is limiting the Small and Medium Scale Enterprises from playing its roles in economic development which need to be determined and proffer solutions to allow it flourish for improved socio-economic development of Nigeria.

### **Purpose of the Study**

The purpose of the study is to determine the role and challenges of small and medium scale building construction enterprises in boasting the Nigerian economy and the strategies for improving its role in economic development generally. Specifically the objectives of the study include:

1. To determine the role of micro small and medium scale building construction enterprises in boasting the Nigerian economy for sustainable development.
2. To determine the challenges of micro small and medium scale building construction enterprises in boasting the Nigerian economy.
3. To determine the strategies for improving the role of micro small and medium scale building construction enterprise in boasting the Nigeria economy for sustainable development.

### **Significance of the Study**

The Findings of the study will benefit the stake holders and administrators of building construction industry which will help them understand the roles and challenges facing the enterprises and determine the strategies for improved role in economic development.

## Research Questions

The following research questions served as guide to the study.

1. What are the roles of micro small and medium scale building construction enterprise in boasting the Nigerian economy for sustainable development?
2. What are the challenges of micro small and medium scale building construction enterprise in boasting the Nigerian economy?
3. What are the strategies for improving the role of micro small and medium scale building construction enterprise in boasting the Nigeria economy for sustainable development?

## Methodology

The research design adopted was survey which was used for data collection from the respondents and the area of the study was North Eastern Nigeria. The population of the study was made up of: site clerks, contractors, and estate developers. A sample size of 60 respondents were randomly sampled which made up of 20 site clerks, 20 contractors and 20 estate developers was used for the study. A 42 items structured questionnaire was developed by the researcher which was utilized for collecting data from the respondents. Each question had a four point scale of Strongly Agree (SA4), Agree (A3), Disagree (D2) and Strongly Disagree (SD 1)

The validation of the instrument was done by two experts, in construction technology department of technology education, Modibbo Adama University of Technology Yola. The number of instrument administered to the respondents was 60 copies with the help of two research assistants. The method of data analysis adopted was mean and standard deviation. The decision rules for the analysis was that, any mean score above 2.50 was regarded as agree while the mean score less 2.50 regarded as disagree.

**Research Question 1:** what are the roles of small and medium scale building construction enterprise in boasting the Nigerian economy for sustainable development?

**Table 1**, Mean rating of the Respondents on the roles of small and medium scale building construction enterprise in boasting the Nigeria economy.

S.no	Roles	Site clerks		Contractors.		Estate developers		Remarks
		X	SD	X	SD	X	SD	
1	Boost Job creation	3.05	0.42	3.05	0.75	3.64	0.87	Agree
2	Impetus for economic growth	3.40	0.46	3.40	0.54	3.63	0.75	Agree
3	Improved GDP	3.00	0.40	3.00	0.88	3.65	0.68	Agree
4	Poverty reduction	3.45	0.42	3.45	0.71	3.75	0.83	Agree
5	Economic diversification	3.42	0.56	3.42	0.52	3.61	0.87	Agree
6	Improves National Productivity	3.56	0.40	3.56	0.81	3.79	0.73	Agree
7	Engages the diligent youth	3.06	0.40	3.06	0.45	3.59	0.70	Agree
8	Encourages self reliance	3.36	0.49	3.36	0.48	3.59	0.83	Agree
9	Provides conducive atmosphere for exploration and growth	3.43	0.56	3.43	0.66	3.61	0.82	Agree
10	It encourages and support the spread of more enterprises	3.52	0.42	3.52	0.72	3.64	0.87	Agree
11	It is tool for sustainable development	3.34	43.00	3.34	0.78	3.75	0.75	Agree
12	It gives orientation to youth	3.50	0.43	3.50	0.73	3.75	0.73	Agree
13	Reduces burden on government plan	3.52	0.42	3.52	0.82	3.64	0.82	Agree
14	Provide adequate social incentives	3.64	0.42	3.64	0.54	3.75	0.85	Agree
15	Plays pivoted role in world economy	3.42	0.40	3.42	0.56	3.79	0.76	Agree
	<b>Grand Mean</b>	<b>3.36</b>		<b>3.36</b>		<b>3.49</b>		

Key: X= mean, SD=Standard Deviation.

Table 1, reveals that all the items presented have mean responses above 2.50 which indicate that they are the role of small and medium scale enterprise in Nigeria. The standard deviation also ranges between 0.40-0.87 and are positive indicating that the opinion of the respondents are not far from the mean and close to one another in opinion. The mean ratings between 3.61-3.79 which is above 2.50 decision rule indicate that: it boasts the economy, encourages self reliance, serves as tool for sustainable development, provide orientation for the youth, and provide impetus for economic growth and Gross Domestic Product.

**Research Question 2:** what are the challenges of small and medium scale building construction enterprise in boasting the Nigerian economy?



**Table 2.** Mean rating of the Respondents on the challenges of small and medium scale building construction enterprise in Nigeria.

S.no	Roles	Site clerks		Contractors.		Estate developers		Remarks
		X	SD	X	SD	X	SD	
1	Lack of funds	3.05	0.42	3.05	0.75	3.64	0.87	Agree
2	Lack of skills	3.40	0.46	3.40	0.54	3.63	0.75	Agree
3	Fear of risks	3.00	0.40	3.00	0.88	3.65	0.68	Agree
4	Wide spread Poverty	3.45	0.42	3.45	0.71	3.75	0.83	Agree
5	Lack of loan facility	3.42	0.56	3.42	0.52	3.61	0.87	Agree
6	Lack of initiatives for Productivity	3.56	0.40	3.56	0.81	3.79	0.73	Agree
7	Lack of diligent youth	3.06	0.40	3.06	0.45	3.59	0.70	Agree
8	Lack of Encouragement	3.36	0.49	3.36	0.48	3.59	0.83	Agree
9	Lack of conducive atmosphere for exploration and growth	3.43	0.56	3.43	0.66	3.61	0.82	Agree
10	Lack of spread of enterprises	3.52	0.42	3.52	0.72	3.64	0.87	Agree
11	Lack of understanding it as tool for sustainable development	3.34	0.43	3.34	0.78	3.75	0.75	Agree
12	Lack of orientation to youth	3.50	0.43	3.50	0.73	3.75	0.73	Agree
13	Lack of government plan	3.52	0.42	3.52	0.82	3.64	0.82	Agree
14	Inadequate social incentives	3.64	0.42	3.64	0.54	3.75	0.85	Agree
15	Lack of vision of its pivoted role in world economy	3.42	0.40	3.42	0.56	3.79	0.76	Agree
<b>Grand Mean</b>		<b>3.36</b>		<b>3.36</b>		<b>3.49</b>		

Table 2, reveals that all the items presented have mean responses above 2.50 which indicate that they are the challenges of small and medium scale enterprise in Nigeria. The standard deviation also ranges between 0.40-0.87 and are positive indicating that the opinion of the respondents are not far from the mean and close to one another in opinion. The mean ratings between 3.00-3.85 which is above 2.50 decision rule indicate that; these challenges for small and medium scale building construction in Nigeria..

**Research Question 3:** what are the strategies for improving the role of small and medium scale building construction enterprises in boosting the Nigeria economy for sustainable development.

**Table 3.** Mean Rating of the Respondents on Strategies for improving the role of small and medium scale building construction enterprises in boosting the Nigeria.

S. No	Strategies	Site Clerks		Contractors		Estate Developers		Remarks
		X	SD	X	SD	X	SD	
1	Improved funding SMSBE	3.75	0.45	3.56	0.67	3.44	0.56	Agree
2	Involve NGOs in Funding SMSE	3.64	0.47	3.56	0.51	3.26	0.45	Agree
3	Industries should train in skills	3.64	0.46	3.14	0.54	3.55	0.43	Agree
4	Improve availability and utilization training outlets	3.79	0.40	3.08	0.45	3.75	0.54	Agree
5	Wealthy Individuals support SMSE	3.75	0.32	3.28	0.45	3.45	0.50	Agree
6	Students should be sensitized on the importance of SMSBE	3.61	0.42	3.40	0.47	3.58	0.43	Agree
7	Advertise for patronage SMSE	3.79	0.40	3.67	0.46	3.43	0.34	Agree
8	Encourage Industry collaboration	3.64	0.47	3.23	0.54	3.25	0.42	Agree
9	Improve atmosphere for SMSE	3.59	0.49	3.67	0.46	3.54	0.47	Agree
10	Attach financial value to some categories of Skills	3.83	0.46	3.27	0.43	3.65	0.46	Agree
11	Improve the ability for independent development of SMEs	3.64	0.42	3.15	0.47	3.54	0.45	Agree
12	Encourage indigenous products	3.65	0.48	3.48	0.50	3.65	0.46	Agree
<b>Grand Mean</b>		<b>3.70</b>		<b>3.37</b>		<b>3.50</b>		

The mean responses on table 3 ranges between 3.59-3.79. This indicates that the respondents agree that the 12 items presented are strategies for improving the role of small and medium scale enterprises in boosting the Nigeria economy for sustainable development. The standard deviation ranges between 0.40-0.56 this shows that there is no significant deviation from the mean which indicate that the opinions of the respondents are not far from one another. This helps strengthen the values of small and medium scale building construction enterprise. The 12 items on table 3 were strategies for improving the role of small and medium scale building construction; this became clear from the mean responses ranged between 3.59-3.79 rating above the 2.50 decision rule.

### Findings of the Study

1. It was found that the items on Table 1 have mean ratings between 3.61-3.79 which indicate that they are roles of SMS Building Construction Enterprises for boosting the economy of Nigeria for sustainable development.
2. It was also found that the 15 items on Table 2 were challenges of small and medium scale building construction enterprises in boosting the Nigerian economy. This became clear from the mean responses ranged between 3.59-3.79 rating above the 2.50 decision rule.

3. It was found that the items on Table 3 have mean ratings between 3.61-3.79 which indicate that they are strategies for improving the role of small and medium scale Building Construction Enterprises in boosting the Nigeria economy for sustainable development.

### **Discussion of Findings**

The role of small and medium scale building construction enterprises has important place in a major platform in the development of the economy of Nigeria. It is an impetus for mainstay of the economy especially in job creation and self reliance of the people. Generally, small and medium scale building construction enterprise is the principal driving force for socio-economic growth and development of the nation (Leos, 2012). The Small and medium scale building construction enterprises has a major role of boasting job creation, economic growth, improve GDP, reduce poverty among the people, encourages self reliance and general wellbeing of the nation. Ojemba (2000) has identified the characteristics of small and medium scale enterprises as follows: managers are owners, area of operation mainly local, owners supplied capital small in the industry, having a great sense of independence, have strong sense of enterprise, high value of time has expectation of quick and concrete result, entered the business by chance. These characteristics make the entrepreneur posses the operational experience for sustenance and greater achievements of the roles of small and medium scale enterprise.

It was also found that there are allot of challenges facing small and medium scale building construction, which include: lack of funds, lack of skills fear of risks, poverty, lack of loan facilities, lack of initiatives, lark of orientation, lack of plans and lack of vision. According to Ezinwa (2018) SMES need a robust financing to meet needs at each stage of their life cycle from start through operation, development, restructuring, from and beyond. When we consider loan the interest charged by commercial banks is about 27-30 percent. The high interest charged makes it difficult for entrepreneurs to access loans. These impediments according to Ugwua (2017) increase the level of unemployment, and poverty in Nigeria.

It was found that some strategies can improve the role of small and medium building construction enterprises which include: improved funding of SMEs, involvement of NGOs, industrial collaboration in skills training, by provide training outlets, by sensitize the youth on the importance of SMEs, and encourage local content development. When these strategies are applied it will help curb the challenges of impeding the growth of SMES in Nigeria. According to Ugwua (2017) since SMEs are vital for the economic growth and job creation it need adequate funding to meet needs at each stage from creation through operation, development restructuring and recovery.

### **Conclusion**

The small and medium scale building construction enterprises have been identified in this study as important in its contribution to the socio-economic wellbeing of Nigeria. This is noticeable in job creation, reduction in poverty level, encourages self reliance of people, and generally on the

Gross Domestic Products (GDP) of the nation. However there are challenges that have negative impacts on the role of small scale businesses which usually leads to retardation and failure experienced by most small and medium scale businesses. The major challenges identified are those that have to do with resource management such as financial and human resource in the enterprise. To improve the role of small and medium scale building enterprises in Nigeria the sources of funding has to be made available and easy to access by the entrepreneur and the business have to be registered and managed professionally and skillfully.

### **Recommendation**

The role of small and medium scale building construction enterprises in the development of the economy should be emphasized, and this should be supported and facilitated by relevant authorities and stakeholders in Nigeria. A conducive atmosphere needs to be created for building construction enterprises to thrive and make SMEs a paramount priority in the plans for economic development of Nigeria.

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## MONTHLY SLAUGHTER OF BOVINE, CAPRINE, OVINE AND FOETAL WASTAGES IN YOLA MODERN ABATTOIR

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### ABSTRACT

This study surveyed the monthly slaughter of bovine (cattle), caprine (goats) and ovine (sheep) in Yola Modern Abattoir (slaughterhouse defined below) (YMA) and foetal wastage of bovine, caprine and ovine in YMA caused by indiscriminate slaughter of gravid cows, does and ewes. The study was conducted between January, 2010 and June, 2014. A total of 55475 bovine; 20035 caprine and 9880 ovine were slaughtered in the YMA with a total number of 1909 bovine; 431 caprine and 409 ovine foetuses wasted during the period. The survey showed that bovine is the most highly slaughtered followed by caprine then ovine in YMA. Foetal wastages (losses) also followed the same order due to volume of slaughter; but there were differences between foetal wastages and months of the year; and between foetal losses and annual slaughter. It was recommended that there should be proper enforcement of legislation, provision of facilities, and examination of all animals especially the female before slaughter to reduce foetal wastages to the barest minimum for food security and improved nutrition in Nigeria.

**Key words:** abattoir, foetal wastage, bovine, caprine, ovine

## Introduction

An abattoir, also known as slaughterhouse, may be defined as a place where animals are killed (slaughtered) in a sanitary condition to ensure meat safety and wholesomeness for human consumption. According to Kwaghe, Adesokan, Ameh Ambali, Ndahi, Cadmus and Kudi (2016), an abattoir is a building for butchering and it houses facilities to slaughter animals, dress, and cut and inspect meats, refrigerates, cure and manufacture by products. Furthermore, it is a special facility designed and licensed for receiving, holding, slaughtering and inspecting meat animals and meat by products before their release to the public (Kwaghe et al, 2016). Therefore, abattoir operations are meant to recover the edible portions of slaughtered animals for safe human consumption (Fearon, Mensah & Boateng, 2014).

According to the Colombia Electronic Encyclopaedia (2013), the facilities, construction, drainage, water supply, disposal of refuse and all abattoir operations are under the government regulations. The animals commonly slaughtered for meat in Nigeria are cattle, camel, goats, sheep, donkey, rabbits, horses, pigs, buffaloes, monkey and poultry; and game and forest animals that are edible. However, in the area of study, the animals usually slaughtered for meat are cattle, sheep and goats.

A very wide gap exist between the Food and Agricultural Organization (FAO) recommended quantity of animal protein intake of 41.9 kilograms per person per year (FAO, 2013) and protein supply in Nigeria of 8.8 kilograms (Alhaji et al. 2015); countries such as Australia consume approximately 111.5 kilograms per person per year and USA consume approximately 120.2 kilogram per person per year (FAO, 2013). The need for adequate balanced diet cannot be over emphasized, yet the consumption of animal protein by the average Nigerian is very low leading to acute protein malnutrition as was the case with most developing countries. Also, Sustainable Development Goals (SDG) objective number 2 clearly stated: end hunger, achieve food security and improved nutrition, and promote sustainable agriculture. This study falls within the confine of this SDG number 2 especially...improved nutrition and promotion of sustainable agriculture (SDGs: Baseline report, 2017)

Several factors account for low supply of meat in Nigeria, leading to less consumption of meat in relation to plant protein sources which are relatively cheaper. The animal protein in the diet of average Nigerian has been declining due to low level of output as a result of decline in productivity of the national herd (Addass, Midau, Milka & Tizhe, 2010). Indiscriminate slaughter of gravid animals and inadequate meat inspection practices by the veterinary health workers is also contributory to this phenomenon of low productivity of the national herd (Abdulkadir, Jiya, & Kosu, 2008). Mshelia, Aliyara, Hammajoda and Jongur, (1999) reported glaring decline in national livestock population resulting from numerous factors especially liver fluke due to its contribution to national economy. This study posits that foetal wastage is one of the several factors that contribute to decline in national herd population. This, in turn, prompted this study.

To tackle the problem of inadequate animal protein in the diet of an average Nigerian, not only prime breeding males are slaughtered but also gravid animals resulting in to foetal wastage as

reported by different researchers (Raimi, Oduguwa & Bamgboye, 2017; Abdulkadir et al., 2008; Ataja & Uko, 1994; and Oyekunle, Olubanjo & Fasina, 1992). Raimi et al. (2017) reported that one possible factor contributing to the high rate of slaughter of pregnant animals is the season of the year. Pregnant cows were mostly slaughtered for ceremonies while sometimes, it was due to poverty or disease condition of the animal. Abdulkadir et al. (2008) reported that 24.06% of female camels slaughtered in Sokoto abattoir were pregnant. Oyekunle et al (1992) reported that between 14% and 20% of cows slaughtered in Abeokuta and Ijebu-Igbo abattoirs from 1984 to 1989 were pregnant.

High incidence of slaughtering of gravid cows has damnable effects on productivity of animal protein to the ever-increasing population of Nigeria (Raimi et al, 2017). The economic recession witnessed in Nigeria in recent times has forced farmers to sell out even breeding stocks and consequently, slaughtering of not only prime breeding males but also pregnant animals. This has brought deterioration not only in the quality but also in the quantity of animal protein in the diet of an average Nigerian. If this scenario is allowed to continue as observed by Addass et al. (2010), will worsen the already precarious supply of animal protein to the populace as well as threaten the livestock industry in Nigeria.

In assessing the effect of drought on livestock in sub-Saharan Africa, Toulmm (1994) observed that at the extreme dry periods of the year, herders increased their sales of aged animals and less productive females to meet household demands. Abdulkadir et al. (2008) also observed that as the dry season progressed, herders were compelled to sell pregnant females before they die naturally. Often the herders sell off their animals without considering the fertility of the stock before selling either due to ignorance, illiteracy, poverty or disease condition of the animals. Addass et al. (2010) concluded in their study that female animals were slaughtered most during the time of feed scarcity due to advantages of pregnancy to body weight in females, more so that the males resist feed scarcity than pregnant females.

Abattoir foetal wastage is defined as the removal and subsequent discard of one or more fetuses from the gravid uterus of a female animal (Alhaji et al 2015). The practice of slaughtering pregnant ruminants has had a negative effect on the national herd size and total meat production, restricting availability of animal protein. The associated economic losses constrain the contribution of livestock to gross domestic product in the country (Alhaji & Odetokun, 2013). Substantial foetal calf wastage has been recorded at abattoirs in Northern Nigeria (Alhaji, 2011); however, limited studies have evaluated these trends to predict associated trends and facilitate strategic planning and decision making in combating future foetal livestock wastages in Nigeria.

Foetal wastages through indiscriminate slaughter of pregnant animals as observed by Addass et al. (2010), is one of the most destructive practices man has ever used against his production endeavour. Control of foetal wastage in abattoirs will go a long way in increasing the population of livestock in Nigeria, improve nutrition through meat supply and promote sustainable agriculture. Knowledge of the magnitude of bovine, caprine and ovine foetal wastages in abattoirs is necessary to forestall further occurrences. Therefore, it becomes necessary to assess the magnitude of foetal losses and suggest ways of reducing the incidence of



foetal wastages in Nigerian abattoirs so as to increase livestock productivity to meet future challenges.

### Methodology

This study was conducted at the YMA. Yola metropolis is the state capital of Adamawa State. According to Adamawa State Diary (1994), Yola is located between latitude 9° 14'N and longitude 12° 3'E at an altitude of 185 meters. Mshelia et al. (1999) reported that the climatic condition of Yola is marked with two distinct seasons, wet season (April to late October) and dry season (November to late March); Yola has an estimated rainfall of 759 millimetres with the wettest months being July to September. The inhabitants are traditionally herdsman, farmers and fishermen. The state has an estimated population of 3,178,950 people and a population density of 86 persons per square kilometre (National Population Census (NPC), 2006). Adamawa State is located within the North East zone of Nigeria and is bordered on the north by Borno state, on the south by Gombe, on the west by Taraba state and on the east by the Republic of Cameroun.

Survey design was used for the study. Data were obtained from the Livestock Division, Adamawa State Ministry of Agriculture (ADSMOA), Yola; 25 herders and 25 butchers were interviewed orally on the causes for slaughtering gravid animals; and an on-the-spot assessment of foetal wastages was also conducted twice a week throughout the entire period of this study. The meat inspection forms recorded on daily basis by staff of the ADSMOA, Yola documenting number of bovine, caprine and ovine slaughtered daily and foetal wastages recovered at the time of the slaughter were recorded and analysed using percentages.

### Results

Results of the survey showed that summary of slaughtered animals at YMA between January, 2010 and June, 2014 were bovine - 55,475 heads of cattle; caprine – 20,035 heads of goats and ovine – 9880 heads of sheep; giving a grand total of 85,390 heads of animals that were slaughtered within the period under review (See Appendices Tables 1, 2, 3, 4, 5 and 6). These figures do not include any animal slaughtered outside the abattoir that were not recorded as obtainable during ceremonies like Sallah (i.e. Ei del fitri or Ei del hadaya), Christmas, New Year, Marriages or Naming, etc.

From these figures, 31,562 were bulls; 10245 were bucks and 3958 were rams; totalling 45765 male animals; this represents 53.6%. The remaining were 23913 cows, 9790 does and 5922 ewes; totalling 39625 female animals which represents 46.4% of the total animal slaughtered within the period.

The result further revealed that the highest number of foetal wastage occurred during the months of March to June; and was very high in the year 2013 and 2014 (Table 7). Out of the total female animals that were slaughtered during the period, 1909 cows versus 431 does versus 409 ewes; totalling 2749 female animals were pregnant as indicated by the number of fetuses

recovered. If the trend of records in January to June, 2014 is maintained, foetal losses for bovine, caprine and ovine will be highest in the year 2014 (Table 8).

The result on Table 9 showed consistent increase in bovine, caprine and ovine foetal wastages from 2011 to 2014, specifically indicating the bovine as having the highest percentage of foetal losses as a percentage of annual animals slaughtered. The bovine also has the highest percentage of foetal losses as a percentage of overall animals slaughtered; the foetal loss as a percentage of overall slaughter of cattle (bovine) was 3% versus goats 2% and sheep 4% (Table 10). Foetal losses as a percentage of female animals slaughtered in YMA during the period was 8% for bovine versus 4% for caprine versus 7% for ovine (Table 11).

The highest annual slaughter for bovine was in 2012, declined in 2013 but seems to increase again in the year 2014. The highest annual slaughter for caprine was in 2010 and continued to decline consistently in the subsequent years. The highest annual slaughter for ovine was in 2013, and showed a tendency of decline in the succeeding years.

The oral interviews with herders and butchers revealed that the cultural disposition and religious teachings (Christians and Muslims) of the people in the area of the study do not accept the modern method of mechanized method of slaughtering animals. The citizens prefer the manual slaughter of animals by the 'Ulamas'/Mallams' or religious approaches to handling and slaughter of meat animals for public sale and consumption. This is another major reason for the dysfunctional state of the facilities in YMA.

## Discussion

This study revealed that the highest number of foetal wastage occurred during the months of March to June; and was very high in the year 2013 and 2014 (Table 7). This finding agrees with the reports of Addass et al.(2010) and Abdulkadir et al. (2008) that the highest peak of foetal wastages were at the onset of the rainy season when feed scarcity is mostly experienced by herders resulting in the disposal of older less productive or even pregnant animals to avoid loosing the animals naturally through death. The season of the study area also shows that the rains are just about to begin in the months of April to May. These periods are characterized by drought and feed shortages which expose animals to poor nutrition and diseases. Thus, as reported by Abdulkadir et al. (2008), in order to forestall losses due to natural death, farmers prefer to sell their animals.

It has been reported long ago by Beckm, Bremand, Dumus, Ituhu and Compare, (1974) that 70% of the cattle slaughtered during the extreme dry periods were females compared to 30% during the normal periods of the year. German (1975) also reported that most of the cattle sold for slaughter during the dry season were females. Ogwuebu, Oke, Osuagwuth, Akusu and Aire, (1987) reported that during the time of feed scarcity, females of advanced pregnancies were sold most, while Addass et al (2010) opined that selling pregnant females attract money because pregnancy does seems to compensate for body weight of animals to attract buyers and better prices. Generally, male animals have been slaughtered without regard to their age or periods of the year (Wosu & Dibua, 1992).

Foetal losses for bovine, caprine and ovine were highest in the year 2014 (Table 8); The results (Table 9) showed that the bovine has the highest percentage of foetal losses as a percentage of annual animals slaughtered; and the bovine also has the highest percentage of foetal losses as a percentage of overall animals slaughtered (Table 10). This trend was part of the reasons that motivated this study and must be curbed quickly to avoid future losses of next generation of farm animals especially the bovine. The survey revealed the year 2014 as recording the highest foetal losses for all the classes of animals considered in this study. This may be due to insurgent attacks in most parts of Adamawa state which forced the sporadic increase in human population influx in to Yola being the state capital for security reasons, safety and survival. Thus, many people moved into Yola as a safe haven, which in turn caused herders and butchers to slaughter animals indiscriminately due to high demands for animal products.

Considering the high rate of foetal wastages in YMA the following questions may arise:

1. What are the implications of these foetal wastages on the supply of beef, chevron (meat from adult goat) and mutton (meat from adult sheep) in the country since meat production lags behind demand and consumption?
2. What are the economic implications of these losses to the herders, butcher and the nation at large?
3. What role can the government play to ameliorate the problem of foetal wastages?
4. Are there existing legislations to curtail this menace?
5. How can healthy meat supply deficit in Nigeria be augmented?

The implication of continuous foetal wastage is that there will be a reduction in both the consumer and producer welfare through meat shortages and reduced production of calves and other animal products.

### **Conclusion**

The loss of fetuses in YMA was as a result of indiscriminate slaughtering of pregnant cows, does and ewes. Some of the factors that contribute to this are the poor enforcement of appropriate livestock legislation. This study found that regulations that discourage the slaughtering of pregnant animals are not strictly enforced in YMA. There were no functional facilities on ground for pregnancy tests or scanning; animals to be slaughtered are inspected by visual observation only. All processes of meat handling, processing and storage were not observed. Thus, the major livestock production objective of increasing domestic animal protein to meet the demand of the populace, increase farmers' income in order to raise their standard of living and to reduce meat and meat products importation to save foreign exchange earnings, etc are not achieved.

Government assistance in form of loan or subsidy to herders and butchers are not adequate. There are no initiatives on ground to buy off pregnant animals at the point of slaughter to curtail foetal wastages. This loss of fetuses in YMA portrays a gross under estimate of the actual

situation in Adamawa State, because the fact is that, there were uncountable unrecorded slaughter outlets particularly during ceremonies and festivals. Cases of foetal losses during seasonal migration are never reported either. Attempts to forestall foetal wastage as well as to improve on Nigeria's meat supply deficit must pay attention to ways of reducing foetal wastage during slaughter of animals.

### **Recommendations**

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

1. There is the need for government's intervention in animals marketing especially in the areas of legislation, provision of facilities and loans at reduced interest rates and especially on the sale of gravid animals for slaughter. Government could also educate farmers about the effect of selling pregnant animals on their life endeavors.
2. Diagnosis of all pregnancies should be embarked upon by veterinarians according to the laws guiding the slaughtering of animals. Veterinary inspection at animals and animal's products control posts and abattoirs with the aid of modern equipment and facilities must be put in place for example scanners to detect pregnancy.
3. Foetal wastages will be reduced if feed can be provided to female animals during scarcity. Herders need assistance on feeds especially during the period of feed scarcity, and soft loans that will discourage them from disposing reproductive animals in the herd.
4. Mechanical operation of slaughter, handling, processing and storage will guarantee healthy meat and meat products. Therefore, if meat supply is to be maintained, enhanced and to meet future demands, the causes of slaughtering pregnant animals must be reduced to the barest minimum and if possible, completely eliminated.
5. Urgent attention and action should be taken by all stakeholders to reduce foetal wastage during slaughter of animals.

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**Appendix****Table 1: Monthly Slaughter in YMA between January to December, 2010**

Month	Bovine					Caprine					Ovine				
	M	%	F	%	TS	M	%	F	%	TS	M	%	F	%	TS
JAN	450	42.5	610	57.5	1060	385	58.8	270	41.2	655	25	29.4	60	70.6	85
Feb	200	20	820	80	1020	300	65.2	160	34.8	460	50	25	150	75	200
Mar	470	42	650	58	1120	200	62.5	120	37.5	320	80	30.8	180	69.2	260
Apr	430	41	620	59	1050	500	67.6	240	32.4	740	75	31.3	165	68.7	240
May	350	35	650	65	1000	490	70	210	30	700	60	30	140	70	200
Jun	410	37.6	680	62.4	1090	380	76	120	24	500	80	22.2	280	77.8	360
Jul	240	21.2	890	78.8	1130	500	68.5	230	31.5	730	65	30.5	148	69.5	213
Aug	450	36	800	64	1250	200	57.1	150	42.9	350	30	17.6	140	82.4	170
Sep	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Oct	360	28.6	900	71.4	1260	460	65.7	240	34.3	700	50	19.2	210	80.8	260
Nov	380	29.2	920	70.8	1300	210	42	290	58	500	35	17.5	165	82.5	200
Dec	460	38	750	62	1210	360	64.3	200	35.7	560	30	27.3	80	72.7	110
<b>GT</b>	<b>4200</b>		<b>8290</b>		<b>12490</b>	<b>3985</b>		<b>2230</b>		<b>6215</b>	<b>580</b>		<b>1718</b>		<b>2298</b>

**M**=Male; **F**=Female; **%** = Percentage; **TS** = Total Slaughter; **NR** = no record **GT** = Grand Total

**Source:** Field Survey, YMA; Yola

**Appendix, cont.****Table 2:** Monthly Slaughter in YMA between January to December, 2011

Month	Bovine					Caprine					Ovine				
	M	%	F	%	TS	M	%	F	%	TS	M	%	F	%	TS
JAN	430	31.9	920	681	1350	150	46.9	170	53.1	320	100	45.5	120	54.5	220
Feb	480	39.3	740	60.7	1220	440	68.8	200	31.2	640	90	22.5	310	77.5	400
Mar	650	54.2	550	45.8	1200	200	57.1	150	42.9	350	420	77.8	120	22.2	540
Apr	830	68	390	32	1200	200	57.1	150	42.9	350	30	12.4	212	87.6	242
May	400	38.5	640	61.5	1040	200	57.1	150	42.9	350	30	12.5	210	87.5	240
Jun	580	42	800	58	1380	210	72.4	80	27.6	290	90	46.9	102	53.1	192
Jul	800	61.5	500	38.5	1300	80	80	20	20	100	-	-	100	100	100
Aug	800	66.7	400	33.3	1200	20	40	30	60	50	36	64.3	20	35.7	56
Sep			NR					NR							0
Oct			NR					NR							0
Nov	832	83.2	168	16.8	1000	52	53.1	46	46.9	98	62	60.8	40	39.2	102
Dec	800	80	200	20	1000	62	25.6	180	74.4	242	18	18.4	80	81.6	98
<b>GT</b>	<b>6602</b>		<b>5308</b>		<b>11890</b>	<b>1614</b>		<b>1176</b>		<b>2790</b>	<b>876</b>		<b>1314</b>		<b>2190</b>

**M**=Male; **F**=Female; **%** = Percentage; **TS** = Total Slaughter; **NR** = no record **GT** = Grand Total

**Source:** Field Survey, YMA; Yola



**Appendix, cont.****Table 3:** Monthly Slaughter in YMA between January to December, 2012

Month	Bovine					Caprine					Ovine				
	M	%	F	%	TS	M	%	F	%	TS	M	%	F	%	TS
JAN	320	64	180	36	500	138	69	62	31	200	41	29.3	99	70.7	140
Feb	700	70	300	30	1000	80	66.7	40	33.3	120	20	25	60	75	80
Mar	850	85	150	15	1000	40	66.7	20	33.3	60	15	37.5	25	62.5	40
Apr	1100	73.3	400	26.7	1500	80	61.5	50	38.5	130	92	44.4	115	55.6	207
May	813	81.3	187	18.7	1000	80	66.7	40	33.3	120	20	25	60	75	80
Jun	834	69.5	366	30.5	1200	80	63.5	46	36.5	126	38	51.4	36	48.6	74
Jul	850	74	300	26	1150	75	62.5	45	37.5	120	35	38.9	55	61.1	90
Aug	878	87.8	122	12.2	1000	80	66.7	40	33.3	120	58	72.5	22	27.5	80
Sep	800	80	200	20	1000	150	60	100	40	250	80	53.3	70	46.7	150
Oct	725	60.4	475	39.6	1200	300	73.2	110	26.8	410	202	65	109	35	311
Nov	972	81	228	19	1200	91	75.8	29	24.2	120	12	15	68	85	80
Dec	815	67.9	385	32.1	1200	250	62.5	150	37.5	400	100	66.7	50	33.3	150
<b>GT</b>	<b>9657</b>		<b>3293</b>		<b>12950</b>	<b>1444</b>		<b>732</b>		<b>2176</b>	<b>713</b>		<b>769</b>		<b>1482</b>

**M**=Male; **F**=Female; **%** = Percentage; **TS** = Total Slaughter; **NR** = no record **GT** = Grand Total

**Source:** Field Survey, YMA; Yola

**Appendix, cont.****Table 4:** Monthly Slaughter in YMA between January to December, 2013

Month	Bovine					Caprine					Ovine				
	M	%	F	%	TS	M	%	F	%	TS	M	%	F	%	TS
JAN	921	65.8	479	34.2	1400	217	67.8	101	22.2	318	225	72.1	87	26.9	312
Feb	810	73.6	290	26.4	1100	312	78	88	22	400	82	18.5	238	81.5	320
Mar	950	63.3	550	36.7	1500	335	67	165	33	500	167	47.7	183	2.53	350
Apr	750	58	550	2.4	1300	300	75	100	25	400	150	42.9	200	57.1	350
May	820	62.1	500	37.9	1320	346	69.2	154	30.8	500	182	45.5	218	54.5	400
Jun	900	60.4	589	39.6	1489	162	61.8	100	38.2	262	81	37.7	134	62.3	215
Jul	1059	66.2	541	33.8	1600	320	64	180	36	500	128	32	272	68	400
Aug	800	61.5	500	38.5	1300	201	64.8	109	35.2	310	80	34.8	150	65.2	230
Sep	800	61.5	500	38.5	1300	89	59.3	61	40.7	150	68	68	32	32	100
Oct	832	83.2	168	16.8	1000	52	53.1	46	46.9	98	62	60.8	40	39.2	102
Nov			NR					NR					NR		
Dec			NR					NR					NR		
<b>GT</b>	<b>8642</b>		<b>4667</b>		<b>13309</b>	<b>2334</b>		<b>1104</b>		<b>3438</b>	<b>1225</b>		<b>1554</b>		<b>2779</b>

**M**=Male; **F**=Female; **%** = Percentage; **TS** = Total Slaughter; **NR** = no record **GT** = Grand Total

**Source:** Field Survey, YMA; Yola

**Appendix, cont.****Table 5:** Monthly Slaughter in YMA between January to June, 2014

Month	Bovine					Caprine					Ovine				
	M	%	F	%	TS	M	%	F	%	TS	M	%	F	%	TS
JAN	850	65.4	450	34.6	1300	180	72.0	74	28.0	254	93	43.9	119	56.1	212
Feb	938	63.4	541	36.6	1479	156	66.1	80	33.9	236	70	49.3	72	50.7	142
Mar	1092	72.8	408	27.2	1500	125	62.5	75	37.5	200	182	60.7	118	39.3	300
Apr	902	64.4	498	35.6	1400	145	67.4	70	32.6	215	62	47.7	68	52.3	130
May	920	63.0	540	37.0	1460	150	69.4	66	30.6	216	54	40.3	80	59.7	134
Jun	920	63.4	530	36.6	1450	112	36.1	198	63.9	310	103	48.4	110	51.6	213
<b>GT</b>	<b>5622</b>		<b>2967</b>		<b>8589</b>	<b>868</b>		<b>563</b>		<b>1431</b>	<b>564</b>		<b>567</b>		<b>1131</b>

M=Male; F=Female; % = Percentage; TS = Total Slaughter; NR = no record GT = Grand Total

Source: Field Survey, YMA; Yola

**Table 6:** Summary of Annual Slaughter of Bovine, Caprine and Ovine in YMA between January, 2010 to June, 2014

Year	Bovine			Caprine			Ovine		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
2010	4200	8290	12490	3985	2330	6315	580	1718	2298
2011	6602	5308	11910	1614	1176	2790	876	1314	2190
2012	9657	3293	12950	1444	732	2176	713	769	1482
2013	8642	4667	13309	2334	1104	3438	1225	1554	2779
2014	5622	2967	8589	868	563	1431	564	567	1131
<b>GT</b>	<b>34723</b>	<b>24525</b>	<b>59248</b>	<b>10245</b>	<b>5905</b>	<b>16150</b>	<b>3958</b>	<b>5922</b>	<b>9880</b>

GT = Grand Total

Source: Field Survey, YMA; Yola

**Appendix, cont.****Table 7:** Foetal Losses in YMA between January, 2011 and June, 2014\*

Month	2011			2012			2013			2014		
	Bovine	Caprine	Ovine	Bovine	Caprine	Ovine	Bovine	Caprine	Ovine	Bovine	Caprine	Ovine
JAN	26	13	16	3	4	3	21	10	8	34	9	11
Feb	13	7	5	11	0	0	13	11	8	121	10	4
Mar	33	0	0	13	3	2	40	10	8	200	22	18
Apr	21	4	1	8	5	2	130	51	23	216	30	8
May	22	1	3	6	3	4	123	32	10	142	41	32
Jun	5	2	3	6	3	3	105	1	26	138	38	42
Jul	80	4	2	7	3	3	NR	NR	NR			
Aug	8	3	4	9	3	2	2	10	45			
Sep	Nil	Nil	Nil	10	3	2	41	8	11			
Oct	Nil	Nil	Nil	8	5	11	43	17	41			
Nov	5	6	3	8	3	3	190	22	11			
Dec	6	3	10	18	4	3	24	24	18			
<b>GT</b>	<b>219</b>	<b>43</b>	<b>47</b>	<b>107</b>	<b>39</b>	<b>38</b>	<b>732</b>	<b>196</b>	<b>209</b>	<b>851</b>	<b>150</b>	<b>115</b>

\*Data on foetal losses/wastages in YMA for the year 2010 was not available; **NR**= no record for July, 2013; **nil** = no record in Sep and Oct, 2011 because staff went on strike **GT**= Grand Total

**Source:** Field Survey, YMA; Yola

**Table 8:** Summary of Annual Foetal Losses of Bovine, Caprine and Ovine YMA between January, 2011 to June, 2014

Year	Bovine	Caprine	Ovine
2011	219	43	47
2012	107	43	38
2013	732	195	209
2014	851	150	115
<b>GT</b>	<b>1909</b>	<b>431</b>	<b>409</b>

**Source:** Field Survey, YMA; Yola

**Appendix, cont.****Table 9:** Foetal Loss as a Percentage of Annual Slaughter in YMA between January, 2011 and June 2014

Year	Annual Slaughter			Annual Foetal Losses			Percentage (%)		
	Bovine	Caprine	Ovine	Bovine	Caprine	Ovine	Bovine	Caprine	Ovine
2011	11910	2790	2190	219	43	1.84	1.54	2.15	11910
2012	12950	2176	1482	107	43	0.82	1.98	2.56	12950
2013	13309	3438	2779	732	195	6.62	5.67	7.52	13309
2014	8589	1431	1131	851	150	11.07	10.48	10.18	8589

**Source:** Field Survey, YMA; Yola

**Table 10:** Foetal Loss as a Percentage of Overall Slaughter in YMA between January, 2010 and June 2014

Type of Animal	Total Foetal Loss	Total Slaughter	Percentage (%)
Cattle	1909	59248	3
Caprine	431	16150	3
Ovine	409	9880	4

**Source:** Field Survey, YMA; Yola

**Table 11:** Foetal Loss as a Percentage of Female Slaughter in YMA between January, 2011 and June 2014

Type of Animal	Total Foetal Loss	Female Slaughter	Percentage (%)
Cattle	1909	19125	10
Caprine	431	5805	8
Ovine	409	5922	7

**Source:** Field Survey, YMA; Yola

# DEVELOPMENT OF AN INSTRUMENT FOR EFFECTIVE PRACTICE OF COMMERCIAL FISHERIES BUSINESS FOR CURBING YOUTH UNEMPLOYMENT IN GBOKO METROPOLIS

Imbur Msuur Eunice

## ABSTRACT

The study was carried out on development of an instrument for effective practice of commercial fisheries business for curbing youth unemployment in Gboko Metropolis. The three objectives of the study were to: Identify the basic requirement in starting a commercial fisheries business, Identify the practical skills required in fish management and Identify the challenges encountered in commercial fisheries business. A survey research design was adopted for the study and a structured questionnaire was used as instrument for data collection. Three null hypotheses were tested and the results showed that there is no significant difference in the mean rating of extension agents and fish farmers. Analysis of data revealed that all the items developed on the instrument are required for commercial fisheries business therefore it was concluded that commercial fisheries business requires both human and material resources for effective practice. Based on the findings it was recommended among others that skills required by farmers for effective management in fish production should be packed into training programmes and integrated in skills acquisition.

**Key Words:** Development, Instrument, Effective Practice, Commercial Fisheries Business, Curbing and Youth Unemployment.

## Background of the Study

One of the most popular agribusiness in Nigeria is fish farming and for good reasons. Gone are the days when the only means of getting fish is by catching in the local rivers and ponds through trial and errors. Today the modern farm practice has made it possible to grow fish in the farms and control the input, (Adebayo, 2012; Ndem & Ogbonna, 2016). Fish farming is the act of growing fish for commercial purposes. Fish farming is known as pisciculture, which is the breeding, rearing and transplantation of fish by artificial means. It is the means by which we grow fish at home mostly for commercial purposes, (Adewumi, 2015.; Okwu & Acheje 2011).

Commercial fisheries business is the sub-set of aquaculture that focuses on rearing of fish under controlled or semi controlled conditions for economic and social benefits. It serves as a source of income, reduces the rate of unemployment in the economy and increases the Gross Domestic Product (GDP). According to Adebayo and Daramola (2013) it provides food for the populace, it allows for improved protein nutrition because it has a high biological value in terms of high protein retention in the body, higher protein assimilation as than other protein sources, low cholesterol content and one of the safest sources of animal protein. Fisheries are considered one of the very important businesses contributing to the development of national economy, income generation, employment opportunity, livelihood, and food security for the people. To ensure the practice of fisheries, the development of an instrument to serve as a guide for unemployed youth for the practice of commercial fisheries business is crucial, this will provide the practical information on the production of fish for commercial purposes (Lamidi, 2016).

Development of an instrument for practice of commercial fisheries entails making available the information and facts on skills and management practices that are involved in fish production. It is the step-by-step procedures, the human and material resources required, the skills and managerial abilities that are involved in growing fish for commercial purposes. The engagement of unemployed youth in commercial Fisheries will go a long way by promoting national priorities, culture, social, economics, and environmental conditions, this will contribute to local food security, sustainable livelihoods, poverty alleviation, and provision of job opportunities (Adewumi & Olaleye, 2011). The practice of commercial fisheries business will also go a long way by reducing criminal activities, drugs and human trafficking, and other related offenses in the society. Therefore, Fisheries as a vocation should be regarded as a business when effectively practice can curb unemployment among youth in a society.

The term unemployment denotes a condition of joblessness or lack of employment. In other words, anyone who is fit and available to work but fails to get job may be considered as being unemployed for the concerned period (Olubukola, 2013). The rapid rise in the unemployment rate has become a major source of concern. Several school leavers and employable adults are either finding it difficult to secure employment or are laid off work for one reason or the other. Youth unemployment's rate is a threat to national security. Many of the youths have no jobs and this undesirable situation. The rapid increase in the population of unemployed youth has been described as a time bomb. Unemployment can lead to the following: loss of status, loss of prestige and economic strength or power as a result of the loss of wages and benefits of job, infliction of psychological injury as a result of the breakdown in social contacts and isolation

from the world of work, loss of responsibility, identity and respect which the position at work ensures, loss of purchasing power, loss of union check off dues, loss of production and stunting of gross national product (Attah, Audu, & Haruna, 2013).

### **Statement of the Problem**

The rate of unemployment is on the increase among youths, many of the secondary school leavers and graduates go about looking for white collar jobs that are not available, seeking for employment in government and private sectors to no avail. Some do not know the right business to invest their money in order to achieve success while others have insufficient knowledge on the type of business to venture into. There is evidence that fisheries being a very good source of protein when practice for commercial purposes can help reduce unemployment rate among youths (Adewumi, 2015). However, there is lack of practical knowledge in the management processes of growing fish, inability to know the basic requirements in starting the business and to manage the challenges encountered in the process of growing fish lead to poor performance, neglect and profit loss which affects the practice of fisheries as a business.

There is need to make available an instrument that will contain all the requirements and practical knowledge/information on the practice of commercial fisheries business to serve as a guide to the youths to curb unemployment in Gboko Metropolis. It is on this basis that the study is carried out on development of an instrument for effective practice of commercial fisheries business for curbing youth unemployment in Gboko Metropolis

### **Purpose of the study**

The main purpose of the study is development of instrument for effective practice of commercial fisheries business for curbing youth unemployment in Gboko Metropolis. Specifically, the study sought to:

1. Identify the basic requirement in starting a commercial fisheries business
2. Identify the practical skills required in fish management
3. Identify the challenges encountered in commercial fisheries business

### **Research Questions**

1. What are the basic requirements in starting a commercial fisheries business?
2. What are the practical skills required in fish management?
3. What are the challenges encountered in commercial fisheries business?



## Research Hypothesis

**H<sub>0</sub> 1:** There is no significance difference between the mean rating of the fish farmers and extension agents in the basic requirement for starting a commercial fisheries business.

**H<sub>0</sub> 2:** There is no significance difference between the mean rating of the fish farmers and extension agents in the practical skills required in fish management.

**H<sub>0</sub> 3:** There is no significance difference between the mean rating of the fish farmers and extension agents in the challenges encountered in practice of commercial fisheries business.

## Literature Review

Lamidi (2016) stated that there are two types of resources that can be utilized in fish production. They are material or non-human resources such as land, capital assets in form of buildings, machines, farm tools and equipment, farm chemical, water, fish feeds and funds. Each of these material resources plays specific and important role in the fish production process. Human resources involve the farmers or the entrepreneur's knowledge, caring for and managing farm inputs for fish production. In this study, resources are therefore all materials both human and non-human that are all together called inputs required in effective management of fish production (Uko, 2008). It is therefore necessary to enhance skills in fish production to ensure improvement in the level of production thereby creating wealth. The resources in commercial fisheries business has to be effectively managed to ensure efficient production (Mirakzadeh, Cihyasvand, Karami, & Papzan, 2010; Oroky, 2012).

Management involves prudent utilization of the limited resources to achieve maximal output in the form of goods and services. For one to manage any project, effectively, such a person must possess management skills. Management skills in fish farming comprises the skills ranging from site selection where the fish pond will be constructed to harvesting and marketing of fish and fish product. An individual or youths who acquire management skills in fish farming will use the skills to establish and manage a fish farm which will provide financial security for self-employment (Ndem & Ogbonna, 2016). There are a host of problems facing the growth of commercial fisheries business. Ekeleme (2013) explained the challenges to include scarcity of quality seeds (fingerlings), high cost of feeds, high cost of labor, inadequate water supply, lack of land for pond establishment, lack of capital, lack of modern technologies, poor storage facilities, high cost of transportation, mortality of fish due to diseases and water pollution and poaching.

Most farmers have not yet embraced the technology for producing high quality seed. Commercially produced feeds are hard to come by and when available they are expensive for most farmers to afford. Inadequate training programmes for farmers and extension workers have retarded the growth of the fisheries business. This situation results from lack of resources and technical staff (Munialo, 2011). Inadequate outreach programmes and inefficiency in

dissemination of technology transfer to farmers also play a key role in the backwardness in developing the business. Coupled with this, inadequate funding of the sub-sector activities by the government and low investment by the private sector are a major constraint to this sector. In addition, these challenges are compounded by inadequate entrepreneurship skills by the farmers and lack of credit. In fact, extensive water bodies provide great potential for food and incomes for rural population (Shitote, Wakhungu, & China, 2013).

### **Contribution to Vocational Education, Practice and Training**

The impact of commercial fisheries business to vocational education and training are numerous, to mention just a few it will provide professional sound knowledge in the area of fisheries, it will help to improve the structural and cultural process whereby the youth can gain the ability to make decisions and employment changes in his or her hues and other people including adults. It will also provide the need for fostering entrepreneurship mind sets and promoting entrepreneurship education among the youth as a sure way out of poverty facing the youth worldwide today.

## **Research Methodology**

### **Research Design**

The research design for the study is survey. A survey research is one which involves the assessment of public opinion using questionnaire and sampling methods which lays emphasis on the population from where data are collected for detailed study and analysis. Survey research is considered appropriate for this study because data collected from sample of a population can be used for improving existing phenomenon or situation. It is empirically oriented and more realistic in that it investigates phenomenon in their natural setting (Ekele & Sallau, 2017).

### **Population of the Study**

The population of the study was 113. This comprises of 104 fish farmers and 9 agricultural extension workers found in Gboko metropolis.

### **Sample and Sampling Techniques**

The sample size was 113. This comprises of the entire population, every member was considered eligible for the sample because the population was small therefore, the researcher adopts the entire population which is known as Census survey. Hence, they was no sampling technique for the study.

### **Instrument for Data Collection**

The instrument for data collection was a structured questionnaire. The instrument consists of three (3) sections and it is titled Development of Instrument for Effective Practice of Commercial Fisheries Business for Curbing Youth Unemployment Questionnaire (DIEPCFBCYUQ).

This instrument consisting of three sub-sections which have 34 items was developed by the researcher. Section "A" was to identify the basic requirement in starting a commercial fisheries business (6 items), section "B" was to identify the practical skills required in fish management (15 items) and section "C" was to identify the challenges encountered in practice of commercial fisheries business (13 items). All the items were placed on a four-point Likert scale of: Strongly Agree (SA) = 4; Agree (A) = 3; Disagree (D) = 2; Strongly Disagree (SD) = 1

### **Validation of Instrument**

The instrument for data collection was subjected to face and content validity by three experts, two in Fisheries department and one in Agricultural Education department all from University of Agriculture Makurdi. They were asked to critically examine the instrument and provide advice to the researcher on what to do next and their comments were taken into consideration.

### **Reliability of the Instrument**

The instrument was administered to 10 respondents in Makurdi local government area who are not part of the population for trial testing. The reliability coefficient for this study was obtained using Cronbach's alpha. The reliability coefficient was found to be 0.78. Cronbach alpha is considered appropriate because it measures approximately the average of all possible split half correlation which measures the consistency of all items universally and individually.

### **Method of Data Collection**

The research instrument was administered to the respondents by the researcher and with the help of two research assistants who were trained on how to collect data from the respondents. This was done in August within a period of 20 days.

### **Method of Data Analysis**

The data collected were analyzed using descriptive statistics of frequency, percentage, mean, standard deviation and inferential statistics of t-test for testing hypotheses at 0.05 level of significance. The acceptance and rejection level for each item on the questionnaire was determined by providing a bench mark of 2.50. Any item with a mean score of 2.50 and above was accepted and any item with a mean score of less than 2.50 was rejected. The reason for

using *t*-test statistical tool is that it is the most effective statistical tool for comparing the mean achievement scores of two or more groups and also for small sample of population.

## Results Discussion

**Research Question One:** What are the basic requirements in starting a commercial fisheries business?

**Table 1:** Mean scores on responses of the respondents on the basic requirement in starting a commercial fisheries business.

S/No	Items	SA	A	D	SD	X	SD	Remarks
1.	Plot of land	85 (75.2%)	20 (17.7%)	8 (7.1%)		3.68	1.84	Accepted
2.	Source of water (Borehole)	76 (67.3%)	22 (19.5%)	10 (8.8%)	5 (4.4%)	3.50	3.00	Accepted
3.	Pond construction materials/equipment (Manual equipment: picks, hoes, shovels and wheelbarrows, cement blocks etc. Mechanical equipment: bulldozers and wheel loaders)	81 (71.7%)	32 (28.3%)			3.72	0.77	Accepted
4.	Juvenile fish (fingerlings)	63 (55.8%)	40 (35.4%)	10 (8.8%)		3.47	1.63	Accepted
5.	Storage system (warehouse)	86 (76.0%)	27 (23.8%)			3.76	0.80	Accepted
6.	A good knowledge of running the farm	90 (79.6%)	23 (20.4%)			3.80	0.82	Accepted

From table 1 above, it can be said that all the items got a response scores of 2.50 and above which means all the respondents agreed with every item on question one that they are the basic requirement for starting a commercial fisheries business.

**Research Question Two:** What are the practical skills required in fish management?

**Table 2:** Mean scores on responses of respondents on the practical skills required in fish management.

S/No	Items	SA	A	D	SD	X	SD	Remarks
7.	Ability to detect contaminated water	88 (77.9%)	25 (22.1%)			3.77	0.80	Accepted
8.	Ability to detect too much algae in the pond	79 (69.9%)	34 (30.1%)			3.69	0.76	Accepted
9.	Ability to detect risk of oxygen shortage for fish	82 (72.6%)	31 (27.4%)			3.72	0.77	Accepted
10.	Ability to detect water quality	90 (79.6%)	23 (20.4%)			3.79	0.82	Accepted
11.	Ability to detect possible water leaks	95 (84.1%)	18 (15.9%)			3.84	0.86	Accepted
12.	Ability to introduce clean water free from toxic substances into the pond	75 (66.4%)	30 (26.5%)	8 (7.1%)		3.59	1.74	Accepted
13.	Ability to feed the fish with the appropriate feeds	93 (82.3%)	20 (17.7%)			3.82	0.84	Accepted
14.	Ability to detect weeds on the pond and remove them	88 (77.9%)	14 (12.4%)	11 (9.7%)		3.68	1.84	Accepted
15.	Ability to detect the diseased fish in the pond and deal with the situation	79 (69.9%)	28 (24.8%)		6 (5.3%)	3.59	2.69	Accepted
16.	Ability to prevent the invasion of predators from eating the fish such as the hawk, snakes and cats	110 (97.3%)	3 (2.7%)			3.97	0.97	Accepted
17.	Ability to detect when the fish is matured for harvesting	95 (84.1%)	15 (13.3%)	3 (2.7%)		3.81	1.99	Accepted
18.	Ability to carry out selective harvesting in the pond	111 (98.2%)	2 (1.8%)			3.98	0.98	Accepted
19.	Ability to formulate high quality feed	103 (91.2%)	10 (8.8%)			3.91	0.91	Accepted
20.	Ability to preserve fish (smoking and sun drying)	80 (70.8%)	33 (29.2%)			3.70	0.76	Accepted
21.	Ability to market your fish	83 (73.5%)	16 (14.2%)		14 (12.4%)	3.49	2.59	Accepted

From table 2 above, it can be said that all the items got a response scores of 2.50 and above which means all the respondents agreed with every item on question two that they are the practical skills required in fish management.

**Research Question Three:** What are the challenges encountered in commercial fisheries business?

**Table 3:** Mean scores on responses of respondents on the challenges encountered in commercial fisheries business

S /No	Items	SA	A	D	SD	X	SD	Remarks
22.	Inadequate funding	106 (93.8%)	7 (6.2%)			3.93	0.93	Accepted
23.	Poor pond planning and design	39 (34.5%)	40 (35.4%)	12 (10.6%)	22 (19.5%)	2.84	2.34	Accepted
24.	Scarcity of quality seeds (fingerlings)	67 (59.3%)	18 (15.9%)	8 (7.1%)	20 (17.7%)	3.16	2.60	Accepted
25.	Lack of water supply	70 (61.9%)	33 (29.2%)	10 (8.8%)		3.53	1.69	Accepted
26.	Poor farm site	73 (64.6%)	20 (17.7%)	20 (17.7%)		3.46	1.62	Accepted
27.	Sensitive to manage	50 (44.2%)	32 (28.3%)	19 (16.8%)	12 (10.6%)	3.06	2.50	Accepted
28.	Capital intensive	109 (96.5%)	4 (3.5%)			3.96	0.96	Accepted
29.	Fish is priced high	77 (68.1%)	29 (25.7%)	7 (6.2%)		3.61	1.76	Accepted
30.	No byproducts	68 (60.2%)	42 (37.2%)	3 (2.7%)		3.58	1.73	Accepted
31.	Competition from fishermen	55 (48.7%)	31 (27.4%)	20 (17.7%)	7 (6.2%)	3.18	1.45	Accepted
32.	High cost of transportation	81 (71.7%)	32 (28.3%)			3.72	0.77	Accepted
33.	Little to no experience	60 (53.1%)	42 (37.2%)	11 (9.7%)		3.43	1.60	Accepted
34.	Mortality rate of fish	53 (46.9%)	48 (42.5%)	10 (8.8%)	2 (1.8%)	3.34	2.80	Accepted

From table 3 above, it can be said that all the items got a response scores of 2.50 and above which means all the respondents agreed with every item on question three that they are the challenges encountered in commercial fisheries business.

### Testing Hypotheses

**H<sub>0</sub> 1:** There is no significance difference between the mean rating of the fish farmers and extension agents in the basic requirement for starting a commercial fisheries business.

**Table 4:** *t*-test analysis on mean rating of fish farmers and extension agents for the basic requirement in starting a commercial fisheries business.

S/no	Items	X <sub>1</sub>	X <sub>2</sub>	SD <sub>1</sub>	SD <sub>2</sub>	df	<i>t</i> -cal	<i>t</i> -crit	H <sub>0</sub>
1.	Plot of land	3.70	3.44	1.86	1.57	111	0.4691	1.984	NS
2.	Source of water (Borehole)	3.51	3.33	3.01	1.53	111	0.3055	1.984	S
3.	Pond construction materials/equipment (Manual equipment: picks, hoes, shovels and wheelbarrows, cement blocks etc. Mechanical equipment: bulldozers and wheel loaders)	3.72	3.67	0.77	0.75	111	0.1915	1.984	NS
4.	Juvenile fish (fingerlings)	3.50	3.11	1.66	1.43	111	0.7743	1.984	NS
5.	Storage system (warehouse)	3.78	3.56	0.82	0.71	111	0.7624	1.984	NS
6.	A good knowledge of running the farm (Training)	3.80	3.78	0.82	0.81	111	0.0710	1.984	NS

$N_1 = 104$ ,  $N_2 = 9$ ,  $H_0$  = Null Hypothesis, NS = Not Significant

From table 4 above since all the items had a *t*-calculated value less than the *t*-critical of 1.984, it can be said that the test is not significant therefore we accept the null hypothesis. This implies that the opinion of fish farmers and extension agents are the same on the basic requirement for starting a commercial fisheries business.

**H<sub>0</sub> 2:** There is no significance difference between the mean rating of the fish farmers and extension agents in the practical skills required in fish management.

**Table 5:** *t*-test analysis on mean rating of fish farmers and extension agents for practical skills required in fish management.

S/no	Items	X <sub>1</sub>	X <sub>2</sub>	SD <sub>1</sub>	SD <sub>2</sub>	df	<i>t</i> -cal	<i>t</i> -crit	H <sub>0</sub>
7.	Ability to detect contaminated water	3.79	3.67	0.82	0.75	111	1.3328	1.984	NS
8.	Ability to detect too much algae in the pond	3.72	3.44	0.77	0.71	111	1.1272	1.984	NS
9.	Ability to detect risk of oxygen shortage for fish	3.76	3.33	0.80	0.75	111	1.6411	1.984	NS
10.	Ability to detect water quality	3.81	3.56	0.83	0.71	111	0.9990	1.984	NS
11.	Ability to detect possible water leaks	3.87	3.56	0.88	0.71	111	1.2307	1.984	NS
12.	Ability to introduce clean water free from toxic substances into the pond	3.50	3.33	1.66	1.53	111	0.3176	1.984	NS
13.	Ability to feed the fish with the appropriate feeds	3.85	3.56	0.86	0.71	111	1.1544	1.984	NS
4.	Ability to detect weeds on the pond and remove them	3.71	3.33	2.74	1.53	111	0.6592	1.984	NS
15.	Ability to detect the diseased fish in the pond and deal with the situation	3.64	3.00	2.74	2.24	111	0.8065	1.984	NS
16.	Ability to prevent the invasion of predators from eating the fish such as the hawk, snakes and cats	3.98	3.89	0.98	0.90	111	0.2857	1.984	NS
17.	Ability to detect when the fish is matured for harvesting	3.86	3.33	2.05	1.53	111	0.7668	1.984	NS
18.	Ability to carry out selective harvesting in the pond	4.00	3.78	0.00	0.81	111	0.8148	1.984	NS
19.	Ability to formulate high quality feed	3.94	3.56	0.94	0.71	111	1.4963	1.984	NS
20.	Ability to preserve fish (smoking and sun drying)	3.72	3.56	0.77	0.71	111	1.6441	1.984	NS
21.	Ability to market your fish	3.51	3.22	2.61	2.36	111	0.3506	1.984	NS

$N_1 = 104$ ,  $N_2 = 9$ ,  $H_0$  = Null Hypothesis, NS = Not Significant

From table 5 above since all the items had a *t*-calculated value less than the *t*-critical of 1.984, it can be said that the test is not significant therefore we accept the null hypothesis. This implies that the opinion of fish farmers and extension agents are the same on the practical skills required in fish management.

**H<sub>0</sub>3:** There is no significance difference between the mean rating of the fish farmers and extension agents in the challenges encountered in practice of commercial fisheries business.



**Table 6:** *t*-test analysis on mean rating of fish farmers and extension agents for challenges encountered in practice of commercial fisheries business.

S/no	Items	X <sub>1</sub>	X <sub>2</sub>	SD <sub>1</sub>	SD <sub>2</sub>	df	<i>t</i> -cal	<i>t</i> -crit	H <sub>0</sub>
22.	Inadequate funding	3.96	3.67	0.96	0.75	111	0.0856	1.984	NS
23.	Poor pond planning and design	2.87	2.67	2.36	2.26	111	0.2538	1.984	NS
24.	Scarcity of quality seeds (fingerlings)	2.95	2.44	2.41	2.24	111	0.6512	1.984	NS
25.	Lack of water supply	3.56	3.22	1.71	1.46	111	0.6606	1.984	NS
26.	Poor farm site	3.54	2.67	1.70	1.53	111	1.6215	1.984	NS
27.	Sensitive to manage	3.07	3.00	2.51	2.45	111	0.0821	1.984	NS
28.	Capital intensive	3.99	3.67	0.99	0.75	111	1.1932	1.984	NS
29.	Fish is price high	3.64	3.33	1.80	1.53	111	0.5744	1.984	NS
30.	No byproducts	3.60	3.33	1.75	1.53	111	0.5018	1.984	NS
31.	Competition from fishermen	3.19	3.11	2.63	2.55	111	0.0901	1.984	NS
32.	High cost of transportation	3.72	3.67	0.77	0.75	111	0.1915	1.984	NS
33.	Little to no experience	3.46	3.11	1.62	1.43	111	0.6966	1.984	NS
34.	Mortality rate of fish	3.38	3.00	2.85	2.45	111	0.4403	1.984	NS

$N_1 = 104$ ,  $N_2 = 9$ ,  $H_0$  = Null Hypothesis, NS = Not Significant

From table 6 above since all the items had a *t*-calculated value less than the *t*-critical of 1.984, it can be said that the test is not significant therefore we accept the null hypothesis. This implies that the opinion of fish farmers and extension agents are the same on the challenges encountered in practice of commercial fisheries business.

## Discussion of Findings

From the analysis of the data the findings in table 1, 2 and 3 revealed that all the items for the study are required for commercial fisheries business which means they the basic requirement in starting a commercial fisheries business, the practical skills required for fish management and also the challenges encountered in practice of commercial fisheries business. This is synonymous with findings of Lamidi (2016) who explained that material resources like land, capital assets inform of buildings, machines, farm tools and equipment, farm chemical, water, fish feeds and funds can be utilized for fish production as well as human resources which involve the farmer or the entrepreneur's knowledge, caring for and managing farm inputs for fish production.

The findings are also in agreement with that of Ndem and Ogbonna (2016) who asserts that management skills in fish farming comprised the skills ranging from site selection where the fish pond will be constructed to harvesting and marketing of fish and fish product. The study also concise with that of Shitote, Wakhungu, & China, (2013) on the challenges encountered in fish production that there is inadequate training programmes, inefficiency in technology transfer to farmers, lack of resources, entrepreneurship skills and credit for farmers to effectively practice fish production. Based on Data Collection and Analyses the Researcher Produce An Instrument for Fish Production (See Appendix).

## Conclusion

Based on findings of the study the researcher concluded that effective practice of commercial fisheries business require both material and human resources, when this is available and effectively utilized, fish production can serve as a business for curbing youth unemployment rate and poverty reduction in the society.

## Recommendations

Based on the findings of the study the following recommendations are made: Skills required by farmers for effective management in fish production should be packed into training programmes and integrated in skills acquisition. Unemployed youths should be given training on the identified management skills which will enable them to enter into fish farming enterprise and to reduce unemployment in Gboko. Government should provide the needed material and human resources inform of grants or credit to farmers and youth to enable effective practice of fisheries business.

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### Appendix

	REQUIREMENT	ACTIVITY	SAFETY PRECAUTIONS
1.	Capital	You must have money in order to start the business. Capital can be gotten through partnerships with others	Always remember that it is not necessary you must start big, you can start small as a fresher to avoid loose if in case any risk will arise during the process of running your business
2.	Location of the farm (site selection)	Get a plot of land	The land should be of good topography
3.	Source of water	Dig a borehole or the site should be located close to a stream or river	Try to dig a borehole because using stream or river may be quite expensive and stressful if the site is far away
4.	Pond construction materials/equipment	Manual equipment: picks, hoes, shovels and wheelbarrows, cement blocks etc. Mechanical equipment: bulldozers and wheel loaders	Always try to use the manual equipment, this is more affordable and less expensive than the mechanical equipment also remember that there are more equipment not mentioned that can be used, this can be known when you acquire training
5.	Juvenile fish (fingerlings)	Acquire your fingerlings in a commercial fish farm that carries out breeding	This should be according to the size of the pond also remember that there is a need to have more extra pond because as time goes on the fingerlings will grow and will be congested so you need to separate in order to allow more space for good health
6.	Storage system	Construct a warehouse	This should be according to your capacity and to the size of the farm
7.	A good knowledge of running the farm (Training)	Go to a well experienced or professional who is already in to the business for some time to acquire training on how to carry out fish production	Have a very good relationship with your trainer for consultations in case of any abnormalities during the process of carrying out your own business
8.	Ability to detect contaminated water	When you notice a smell from the water. Always change the water frequently as required	Keep an eye on the pond regularly
9.	Ability to detect too much algae in the pond	When the water smells a lot and turns greenish in colour. Always change the water frequently as required	Keep an eye on the pond regularly
10.	Ability to detect risk of oxygen shortage for fish	When the water is contaminated. Always change the water frequently as required	Keep an eye on the pond regularly
11.	Ability to detect water quality	Change the water at least every two weeks	Keep an eye on the pond regularly
12.	Ability to detect possible water leaks	When there is breakages inside the pond or the pond is always wet from outside	Keep an eye on the pond regularly

**Appendix, cont.**

13.	Ability to introduce clean water free from toxic substances into the pond	Borehole water is the safest water that is free from toxic substances that can be used for fish production	Always use borehole water
14.	Ability to feed the fish with the appropriate feeds	Formulate your own feeds or acquire the commercial feed in the market	High quality feed can be formulated only when you get a professional sound training
15.	Ability to detect weeds on the pond and remove them	Remove weed grown on the pond by hand picking in order not to destroy the pond	Keep an eye on the pond regularly
16.	Ability to detect the diseased fish in the pond and deal with the situation	A diseased fish is noticed when it is floating on top of the water in an inverted position with a whitish swollen abdomen	Keep an eye on the pond regularly
17.	Ability to prevent the invasion of predators from eating the fish such as the hawk, snakes and cats	Ensure the site is well fenced with no leakages also hire people as security to keep an eye on the pond always	Keep an eye on the pond regularly
18.	Ability to detect when the fish is matured for harvesting	Ideal period for matured fish is six months	You can start harvest at the sixth month of production
19.	Ability to carry out selective harvesting in the pond	Use hand net made for catching fish to catch fish according to the size that you want	Use a scale to determine the size of fish
20.	Ability to formulate high quality feed	Get training on how to formulate high quality feed	Get professional advice on feed formulation
21.	Ability to preserve fish (smoking, sun drying or microwave)	Use hot burning charcoal for smoking and also by setting the fish under sun for drying or use microwave to preserve your fish	Ensure that the heat is not too much in order not to cause burning
22.	Ability to market your fish	Carry out market survey on where and how to sell your fish	Survey the market, know how much fish is priced before starting in order to avoid losing your capital

# DEVELOPMENT OF AN INNOVATIVE PROGRAMME: MASTER OF EDUCATION FOR VOCATIONAL EDUCATION AND TRAINING

Maria Gruber and Alfred Riedl

## ABSTRACT

The new programme alleviates the severe shortage of teachers in the fields of metal technology, electrical engineering & information technology, and in physics and mathematics in Germany's Vocational Schools. It offers an intensive, fast track to a career at vocational schools for those already holding a B.Sc. in Engineering Sciences, a new target group that had previously been excluded from the professional prospects in this area. It is a holistic alternative to fragmentary short-track qualification opportunities for career changers. The programme aims to improve the quality of vocational teacher education and training, to establish professional standards and to transfer findings from this programme to other fields of VET. With regards to the content and form of the programme, the main focus lies on enabling participants to develop and optimize the necessary skills to teach in the mentioned fields in only three years. The following article is closely based on Riedl et al. (2018) and Gruber et al. (2018).

**Keywords:** Fast-Track Programme for Future Teachers, Aligning Curricula of Different Institutions, Systematic Linkage of Theory and Practice, Innovative Concept for Teacher Education and Training, Vocational Teacher Education and Training

## Starting Point and Goals

In Bavaria, in order to become a teacher at a vocational school, it is required to first study at university, followed by two years of teacher training at school. In Germany, regulations for teacher education and training vary from one federal state to another. They have in common that it's obligatory for future teachers to study teaching at least two different subjects. Also, there is a preparation service after university that takes between one and two years. The 'first phase' of teacher education is provided by a university, traditionally focussing on educational theory and science. Separate from this, the more practical, so-called 'second phase' of teacher education is provided by 'Staatliches Studienseminar', a governmental institution responsible for in-class teacher training which decides whether an aspirant will be granted civil servant status.

At Technical University of Munich (Technische Universität München/TUM), the regular course of study 'Vocational Education' for the teaching profession at vocational schools, divided into a Bachelor's and Master's degree, has been offered since 2008 in six vocational disciplines. The number of graduates, however, has been lagging behind the number of open positions for many years, especially in the fields of electrical engineering & information technology and metal technology (see Monitor Lehrerbildung 2017, summary of causes for this shortage see Riedl et al. 2018, p. 74). Various measures have been taken to recruit teachers for these professional fields (regarding Bavaria see e.g., Bayerisches Staatsministerium für Unterricht und Kultus). In Bavaria in September 2018, approximately 50 percent of graduates in electrical engineering & information technology and metal technology were recruited through these measures. In comparison to traditional teacher education and training, these measures appear to represent emergency solutions which cannot fully prepare participants to meet the challenges of everyday life as a teacher (Schlausch 2013, see summary in Riedl et al. 2018, p. 74). Yet, high-quality vocational education and training contributes to the success of the German economy due in part to its technical innovations. Vocational training and its quality are largely the responsibility of teachers at vocational schools and those involved in training companies. In addition to economic aspects, vocational schools are important for the personal development of young people, helping them find their role in society and private life as well as for recognizing and fulfilling their opportunities and duties, e.g., from a political point of view. The teachers themselves, their skills and their own training play a central role here. Thus, innovative training concepts are urgently needed alongside new target groups of future teachers.

Briefly, the aims of the new Master's program are, first, to alleviate the severe shortage of teachers in the fields of metal technology, electrical engineering & information technology, mathematics and physics at vocational schools by addressing a new target group and providing an attractive access to that career, and, second, to provide new impulses for an improved teacher education and training and to offer high quality education and training for future teachers, e.g., by systematically combining theory and practice in innovative concepts and by the close cooperation of hitherto separately acting institutions.



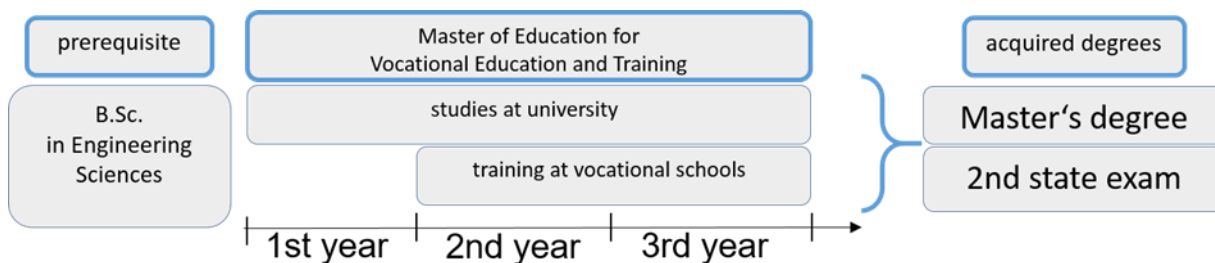
## Concept of the New Degree Programme

The concept of the new degree programme has been developed based on a profound literature review, as well as experiences and findings of previous studies. The most relevant publications in this regard concern criteria for teacher education and training, especially the relation and combination of theoretical and practical components of programmes for future teachers, and conditions for success for a profitable cooperation of different institutions (see e.g., Dieck et al. 2010, Dietrich 2014, Gräsel, Fußangel & Pröbstel 2006, Huber 2005, Neuweg 2004 & 2011, Oser 2001, Schubarth 2010, Speck, Schubarth & Seidel 2007, Tenberg 2015). For a thorough literature review please refer to related publications such as Kronsfoth (2020), Riedl, Schindler & Moser (2016) and Riedl et al. (2018).

The study programme offers a course in which participants who hold a Bachelor's degree in engineering sciences or at least an equivalent degree in engineering receive a high-quality education in educational science and didactics by closely linking their studies with their teacher training. To this end, a concept has been developed in which for the first time scientific studies at university are systematically intertwined with the practical training that usually takes place only after studies have been finished (see Arnold 2010, Keuffer & Oelkers 2001, Speck, Schubarth & Seidel 2007). Whilst contributing to ensuring high-quality teacher training and to the potential use of the resulting impulses to optimize teacher education and training, this study programme for engineers increases the attractiveness of teacher training, for example in terms of time (in comparison short duration of the combination of master's studies and clerkship), finance (from the second year on, swearing-in as civil servants for revocation and receipt of aspirant remuneration) and qualification (in addition to the vocational specialization, a teaching qualification is acquired in a teaching subject). A new target group consists of graduates with an engineering bachelor's degree from a university of applied sciences who are also given the opportunity to enter the higher teaching profession at vocational schools.

Within three years, participants in the programme receive a full Master's degree for teaching at vocational schools and the second state examination at the same time (see Figure 1). The latter is required in order to achieve status as civil servant (associated with e.g., better working conditions regarding income and irredeemable contract).

**Figure 1.** Prerequisite, Progress and Degrees in the New Master's Programme



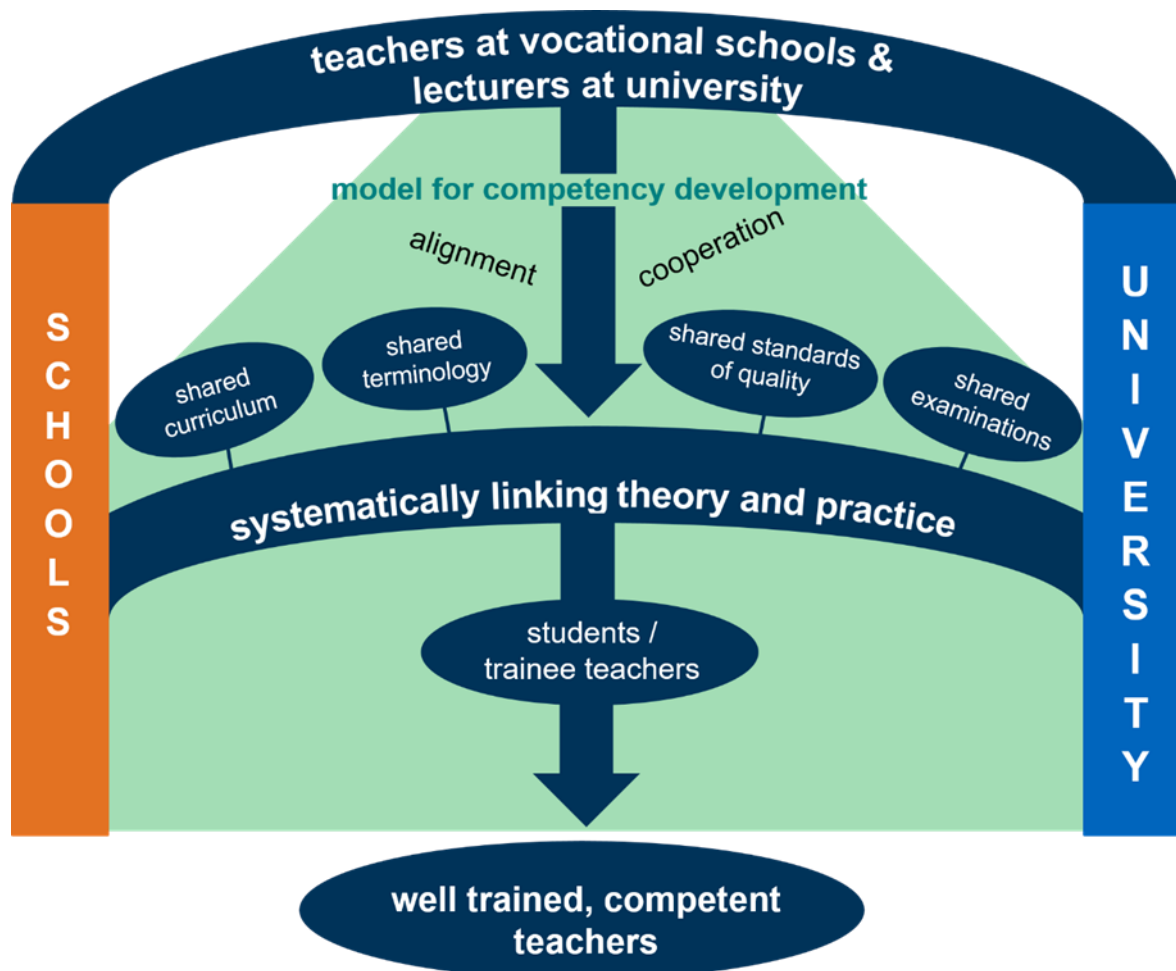
### ***The Students Respectively Trainees***

The programme starts in the winter semester. In addition to electrical engineering & information technology or metal technology, mathematics or physics must be chosen as a teaching subject. In order to be able to start training at a vocational school in the third semester, students need a vocational training qualification that matches their vocational specialization or, alternatively, proof of 48 weeks of relevant professional experience. In the latter case, at least 30 weeks of relevant work experience must be completed by the end of the application deadline and 36 weeks by the start of the Master's programme. This leaves one year to make up for the missing three months of practical training. The suitability of the applicants is ensured by an aptitude committee. Relevant aspects here are e.g., expert knowledge, motivation, interest, and previous pedagogical experience of the applicants.

### ***The Degree Programme***

The model for the study programme is the following (the paragraph follows Kronsfoth, Gentner & Gruber 2018):

**Figure 2.** Foundation of the New Master of Education for Vocational Education and Training (Kronsfoth, Gentner & Gruber 2018)

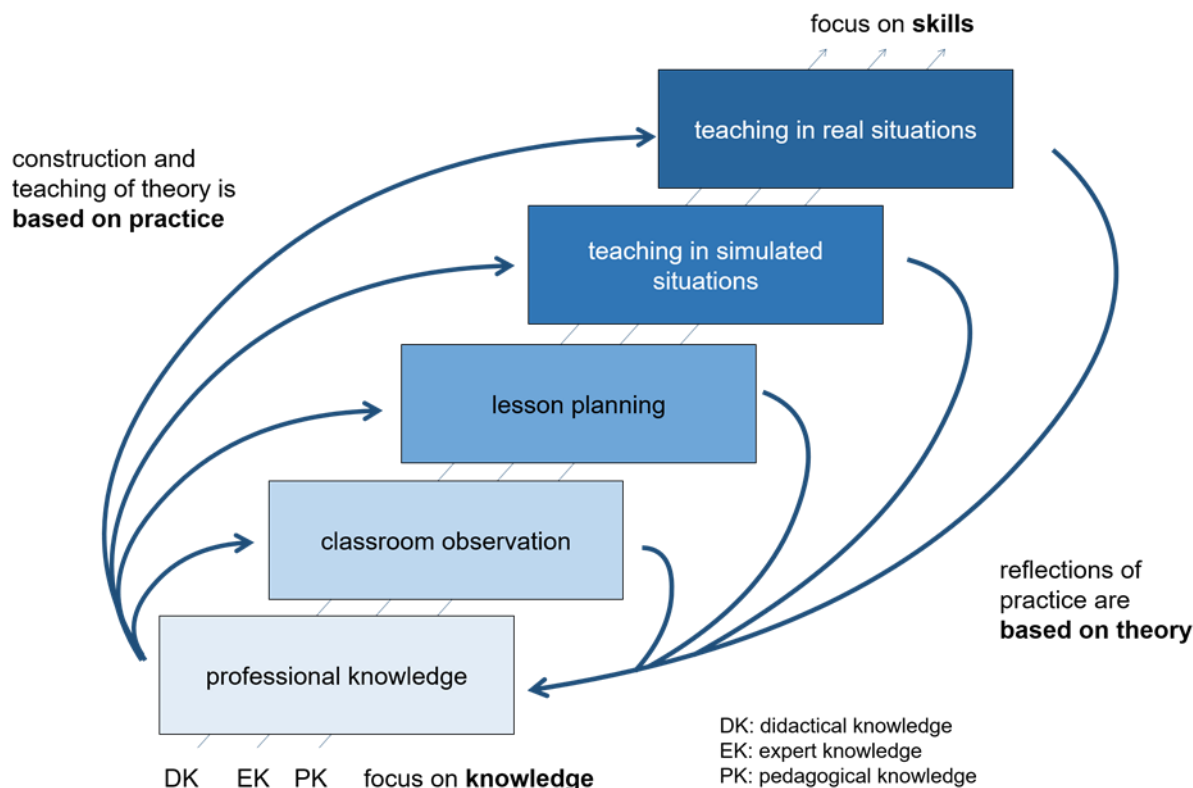


As Figure 2 shows, teachers and lecturers link the stages of teachers' education and training by building a bridge of close cooperation between both, so far separately acting, institutions. On the basis of an innovative competency development model (see the following section), supervisors of both institutions combine both theory and practice through continuous coordination and cooperation. This is reflected in a shared terminology, a coherent curriculum that coordinates content at the university and vocational schools, shared quality standards of good teaching, cooperative formats in university teaching and schools, and aligned examination criteria and formats. The aim is to use these linking elements to train students/trainee teachers intensely, to generate synergy effects, and thereby produce highly qualified, competent teachers at vocational schools.

### **Model for Developing Competencies**

The competency development model (see Figure 3), which the study programme is based on, envisages that prospective teachers are gradually led from professional knowledge to lesson planning and classroom observation as well as actual teaching in simulated environments, and later, to real teaching at schools. The crucial factor here is that every step refers back to professional knowledge so that this is continuously linked with experience and empirical knowledge (Seidel et al. 2015).

**Figure 3.** Model for Developing Competencies as Basis for the New Study Programme (see Gruber, Niederreiter & Riedl 2020, p. 298)



The model for developing competencies is implemented, for example, with the help of a specially developed lesson planning document, which is used from the first semester onwards in several coordinated courses, in the first school internship, in a joint retreat in the third semester with micro-teaching in simulated teaching situations and for teaching in real classes.

### Structure of the Programme

The first two semesters of the degree programme take place full-time at TUM and lay the foundation for entry into the training phase. They include a 15-day-school-internship. From the third semester onwards, selected teachers at eight vocational schools (two per vocational specialization and teaching subject) are responsible for the teacher training. They coach the trainee teachers and offer seminar groups on special topics which are exclusively reserved for the participants of the new study programme, as the training content is coordinated in detail with the university. The weekly structure connecting university and school from the third semester onwards schedules as follows:

**Figure 4.** Weekly Schedule of the New Master's Programme (compare Riedl et al. 2018, p. 80)

	Monday	Tuesday	Wednesday	Thursday	Friday
6 <sup>th</sup> semester at university 4 <sup>th</sup> half-year at school	university advanced seminar	vocational school (focus: vocational specialisation and/or teaching subject)			
5 <sup>th</sup> semester at university 3 <sup>rd</sup> half-year at school	university advanced seminar	vocational school (focus: teaching subject) class on special topics	vocational school (focus: vocational specialisation and/or teaching subject)		
4 <sup>th</sup> semester at university 2 <sup>nd</sup> half-year at school	university advanced seminar	vocational school (focus: teaching subject) class on special topics	vocational school (focus: vocational specialisation)		class on special topics
3 <sup>rd</sup> semester at university 1 <sup>st</sup> half-year at school	university advanced seminar		vocational school (focus: vocational specialisation) class on special topics		
2 <sup>nd</sup> semester at university	university practical experiences/micro teaching				
1 <sup>st</sup> semester at university	university practical experiences/micro teaching				

## Results and Discussion

There are currently three cohorts studying the new Master's programme (the third, fourth and fifth cohort – the latter started in the winter semester 2020/21). The first two cohorts graduated in 2019 and 2020: 35 graduates started successfully their new career as teachers at vocational schools whilst one graduate became a research associate at TUM.

According to feedback and experiences to date, the new teachers prove themselves in the schools. This and the ongoing interest of applicants to the programme indicate that the programme succeeds in alleviating the shortage of teachers in the fields of metal technology, electrical engineering & information technology, mathematics and physics at vocational schools by increasing the attractiveness of the teaching profession at vocational schools and addressing a new target group.

Intensive, ongoing research reveals more positive results regarding the aims of the new 'Master of Education for Vocational Education and Training' such as the successful cooperation of so far separately acting institutions as prerequisite for the programme. The programme's concept combines theory and practice effectively, creates synergistic effects and leads to well prepared, highly qualified teachers, also in comparison with participants of traditional programmes (see Gruber, Niederreiter & Riedl 2020 and Kronsfoth 2020). Self-assessments in form of structured interviews, questionnaires, and interactive panels of former participants one year after their graduation, thus looking back on their first year as regular teachers, confirm that they feel well prepared and equipped for their new career as teachers, they receive positive feedback and they are satisfied with the education and training they had. A paper that addresses this including the limitations associated with self-assessments and other approaches is in preparation. The same applies to further publications on ongoing optimized procedures, concepts, and products concerning the objectives of sustainable teacher education and training, new impulses for an improved teacher education and training and prerequisites for a scientifically supported, practical training to optimally prepare prospective teachers.

Nevertheless, additional research is needed. For example, structured feedback from pupils, colleagues and supervisors of the programme's graduates, long-term studies on the further development of the graduates' competencies and satisfaction with their career change as well as in-depth comparisons of the cohorts with each other and with graduates from other programmes can complete the findings.

## Outlook

The development, implementation, and continuous evaluation for optimization of the new Master's programme is one of four subprojects in the Teach@TUM project within the 'Quality Campaign for Teacher Education and Training' at the faculty TUM School of Education at TUM. It is jointly supported by TUM and Staatliches Studienseminar and made possible by the Bavarian State Ministry for Education and Culture. The project is part of the "Qualitätsoffensive Lehrerbildung", a joint initiative of the Federal Government and the *Länder*

which aims to improve the quality of teacher training. The programme is funded by the Federal Ministry of Education and Research. After the graduation of the fifth cohort the project phase ends (2023). Due to the positive results of the new Master's programme, a permanent establishment of the programme is planned.

Another successful approach at TUM in order to address the shortage of teachers in the above mentioned fields is the cooperation with the University of Applied Sciences in Landshut (see Dollinger & Riedl 2018).

Regarding a closer integration of theory and practice and other findings and impulses for teacher education and training, the new Master's programme is not the only measurement but many promising projects and concepts have been developed in the last years (see e.g., the project 'Universität & Berufsschule - Symbiose für Lehrerbildung' at University of Bayreuth). The initiative "Qualitätsoffensive Lehrerbildung" in Germany brings together thematically matching and mutually beneficial projects for example in the framework of workshops (during the COVID 19 pandemic in a virtual form) and offers opportunities for valuable exchange that inspires and facilitates improvements. Starting from this, closer cooperation and more targeted exchange also across borders, made easy by means of virtual possibilities, could be a useful way forward in the future.

*The authors are responsible for the content of this publication.*

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# **WORK-LIFE BALANCE, WELLNESS, AND WELL-BEING: HOW MIGHT CTE/VET PLAY A ROLE?**

**By**

**John S. Gaal**

## **ABSTRACT**

Over the past decade, the current workplace in North America was made safer through partnerships between industry and the secondary/post-secondary school systems. However, in today's always-on world, workers require a more holistic approach to safety...one that includes work-life balance, wellness, and well-being. Today's fast-paced work environments are driven by tight schedules which often result in workers experiencing undue stress. These stressors often result in forming coping habits that include life-altering addictions. Secondary CTE/VET programs in the past have responded to industry's demands regarding physical health and safety issues. Now is the time for a parallel approach to address the mental health demands required of today's workplaces. This pilot study surveyed post-secondary apprentices—in the USA and Canada—to examine the aforementioned issues and provides recommendations that employers and CTE/VET programs must address in order to recruit and retain tomorrow's workforce . The data were analyzed using both inferential and descriptive statistical tools.

***Key words:*** anxiety, construction, stress, wellness, well-being

## Introduction

Since late 2016, it seems on a weekly basis major news outlets—both conservative and liberal—reported on behavioral/mental health (BMH) issues within the K-16 school system and/or workplace. The concepts of work-life balance, wellness, and well-being have more recently become the focus of many businesses and some school districts. When it comes to pursuing a healthy work-life balance, people struggle with juggling performing at work while attending to the needs of their households. In order to maintain a less stressful, healthy work-life balance one must consider how wellness and well-being play vital roles in process. As we often see in our culture, words are interchanged. However, in this case, it is important to note the difference between wellness and well-being. Wellness is often described from a programmatic/systems approach delivered via the organization. While, well-being is frequently viewed as care (i.e., mind, body, and soul) at the individual/personal level.

It is in this author's opinion that educational programs, that is, (i.e., Career and Technical Education (CTE) or Vocational Education and Training (VET) are well-positioned to better prepare a nation's youth to enter the workforce after high school (secondary level) graduation by addressing BMH issues. Why does this matter? Well, consider what Ellis (2018b, para 2) asserts:

While a career in construction is incredibly rewarding and fulfilling path for many around the world, workers are also experiencing severe issues like stress, depression and anxiety. As a result, too many workers turn to substance abuse or even suicide to cope with their day-to-day pain.

Therefore, failing to integrate BMH topics as well as work-life balance, wellness, and well-being practices into respective CTE/VET programs of study equates to a disservice to future employees, their potential employers, and the communities they serve. After all, recent research suggests that employers will cultivate a more engaged workforce if they tend to the mental health and safety of its employees as well as their physical health and safety.

This pilot study examined an array of issues related to work-life balance, wellness, and well-being—identified in the literature —by means of a survey that compares and contrasts two groups of (post-secondary) construction-related apprentice trades-workers in a Midwestern state of the USA to their counterparts in a Mideastern province of Canada. It will then make recommendations based on these findings.

## Literature Review

When it comes to pursuing a healthy work-life balance, the MHA (n.d., para 1) posits, “With so many of us torn between juggling heavy workloads, managing relationships and family responsibilities, and squeezing in outside interests, it's no surprise that more than one in four Americans describe themselves as super stressed.” In order to not merely cope with stress in our lives, one must learn wellness and well-being strategies that increase his/her resiliency (Bennett, 2014). As such, The LifeDojo Team (2017, para 3), suggests, “The term wellness

generally applies to the physical body, and wellness programs tend to focus on disease prevention and management, health assessments, and other efforts that target high-risk individuals within an organization.” Meanwhile, “Well-being expands the view of wellness to cover more than the physical body, encompassing an employee’s mental and emotional state as well as their productivity and ability to perform at the peak of their capabilities” (The LifeDojo Team, para 7).

Construction industry leaders are much in need of workers as the current workforce is ageing and it becomes more difficult to recruit younger workers (Morrison, 2018). In fact, Ellis (2018a, para 3) states, “Currently, there is an estimated 21.4% industry-wide construction employee turnover rate..., making it one of the highest rates among any industry. What’s more is the average cost of a turnover is up to 20% of the individual’s base pay.” Failing to address work-life balance, wellness, and well-being issues in the workplace will only continue to negatively impact the construction industry’s recent—expensive and extensive but seemingly paltry—recruiting and retention efforts in the USA and Canada. Therefore, from a more holistic approach, the CDC-NIOSH (2018, para. 11) promotes that, “A Total Worker Health approach advocates for the integration of all organizational policies, programs and practices that contribute to worker safety, health and well-being....”

In an age of accountability, an increasing number of educational-thought leaders understand the value of developing the student pipeline long before their students enter the post-secondary world (Chatlani, 2017). Accordingly, the K-12 school systems—especially those districts focusing on CTE/VET programs—have a duty to society to design and deliver curriculum that integrates aspects of wellness and well-being in the workplace in order to ensure their graduates are better positioned to meet the mental and physical demands in today’s unyielding always-on environment. As per Balanko (2019, Slide 16), “...anxiety has become the metaphor for the current moment, reflecting a widespread sense that modern life tends to be overwhelming.”

Research Question: With respect to work-life balance, wellness, and well-being issues, do differences exist between post-secondary CTE/VET students in Canada and the USA?

## **Methodology**

### **Design of study**

Upon review of the literature, a pilot study survey was designed to address 20 factors that have been identified as measures of work-life balance, wellness, and well-being. Once the survey instrument was formatted, the author contacted three respected mental health professionals (two in the USA and one in Canada) to seek their input and obtain face validity. Each of the three professionals responded with constructive feedback that was taken into account and utilized to finalize the survey instrument prior to its launch.

Once the survey was finalized (See Appendix), the author moved on to Step 2, wherein two post-secondary construction-related apprenticeship programs’ administrators were contacted. The one in the Midwestern portion of the USA readily agreed to participating in the pilot study

survey. Soon thereafter, the author spoke with a professional colleague in the Mideastern portion of Canada to determine the level of interest in such a study and to request this program administrator's support.

### **Sample Population & Data Collection**

Once a mutually agreed upon date/time was established, the author proctored the survey in mid-July 2019, at the USA location where 18 apprentices with more than one-year experience participated in the study. With respect to the Canadian location, the author sent a copy of the survey via email to the aforementioned administrator, in late July 2019, for the surveying of 31 apprentices with more than one-year experience. Upon completion, the results were secured and then overnighted to the author via UPS.

### **Data Analysis**

The survey questions were placed into appropriate silos for initial analysis. Survey questions 1-7 dealt with demographic issues while questions 8-27 were related specifically to matters of wellness and well-being. To this end, the only minor adjustments made to the survey were those in questions 1-7 in order to allow for nation-specific items (e.g., state vs province, etc.). Due to the nature of the survey questions, additional minor adjustments were necessary. As such, some survey questions (8-12) required a scoring range of 2 (Never) to -2 (Often) on the Likert scale. Survey question 13 involved the only Yes/No framework in this section. Its range was -1 (Yes) to 1 (No). Survey questions 14-26 utilized a scoring range of -2 (Never) to 2 (Often) or 2 (Never) to -2 (Often)—depending on the positive/negative nature of the question—on the Likert scale. Finally, survey question #27 required a scoring of 1 for each of the first seven response categories and -1 for the eighth (Don't know).

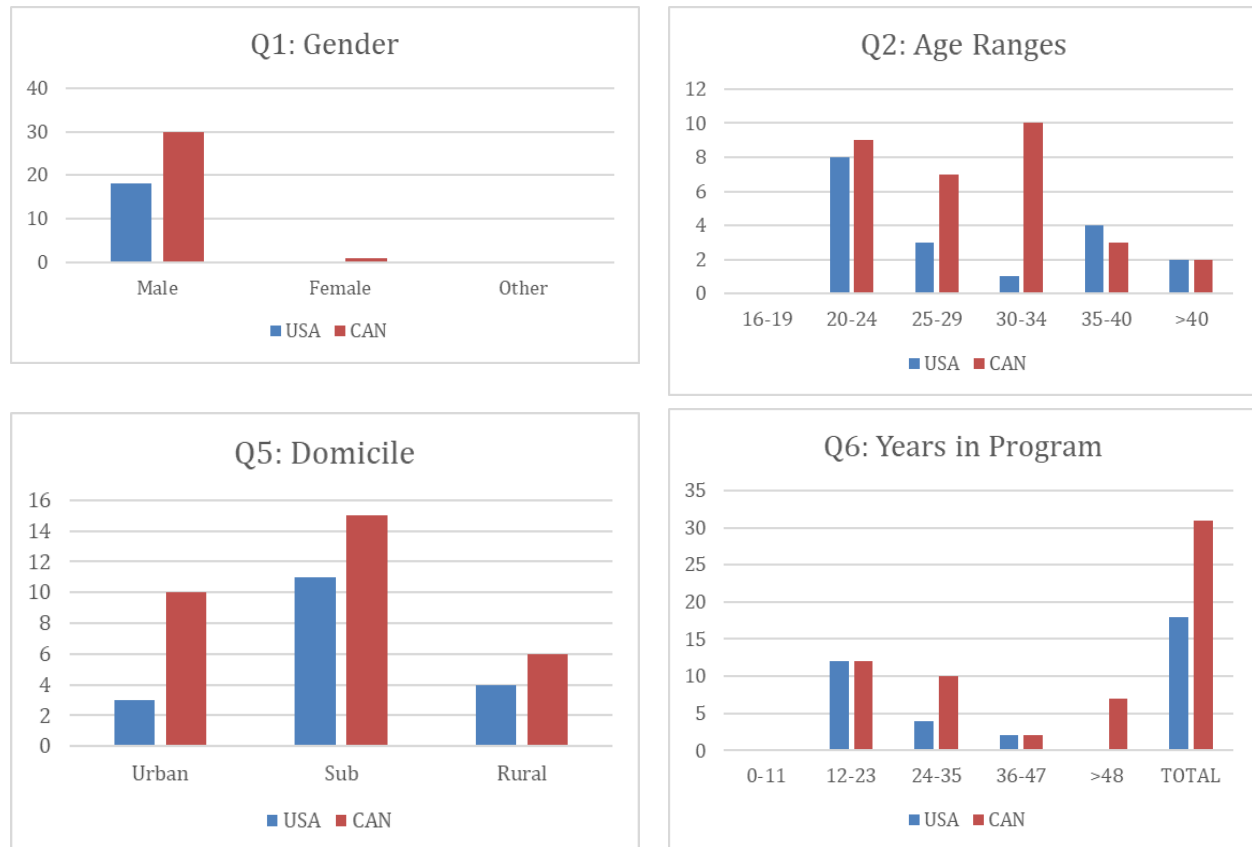
Both data sets were analyzed using the T-test for independent samples and the FIG model (Gaal, 2011). While the T-test for independent samples allows for comparing two groups (i.e., experimental and control) that are independent of one another (Ravid, 2000), the FIG model provides for quantifying Likert scale responses—via an algorithm that calculates weighted averages—to applicable survey questions.

### **Demographics**

When it comes to gender, 48 of the 49 (98%) survey participants were male. More than three-quarters (78%) of the participants were in the 20-34 age range. Over half of the participants (60%) were Caucasians; nine of the 49 (18%), the next largest ethnic group represented, were participants of African descent. When it comes to participants from the USA, 94% were from Missouri while 100% of the participants in Canada were from Ontario. More than half of the participants (53%) lived in suburban settings and 38 of the 49 (78%) were in their respective apprenticeship programs more than one year but less than three years (See Figure 1). In the

USA, 13 of the 18 participants (72%) worked in the residential carpentry sector; whereas, in Canada, 13 of the 31 (42%) participants worked in the commercial carpentry sector.

**Figure 1.**



### Key Indicators

An examination of the FIG scores (See Appendix B) allows one to compare and contrast the differences between the two groups of apprentices on a weighted/proportional basis with respect to work-life balance issues. As noted previously, the FIG model mainly utilizes the Likert scale with values ranging from Never to Often. Survey sub-total results were then multiplied by the appropriate values established above and then totaled.

Once the FIG total scores were determined, this researcher used these results to calculate the T-test score for independent samples. The USA apprentices were considered the control group and the Canadian apprentices were positioned as the experimental group. The result of this calculation was that no significant difference exists between the two means (See Appendix B).

It is important to note that the T-test observed is an aggregated view of the two groups within this study. However, when this researcher examined each of the survey questions (8-27), in a somewhat disaggregated/smaller clustered manner, a few notable observations became worth exploring further. For example:

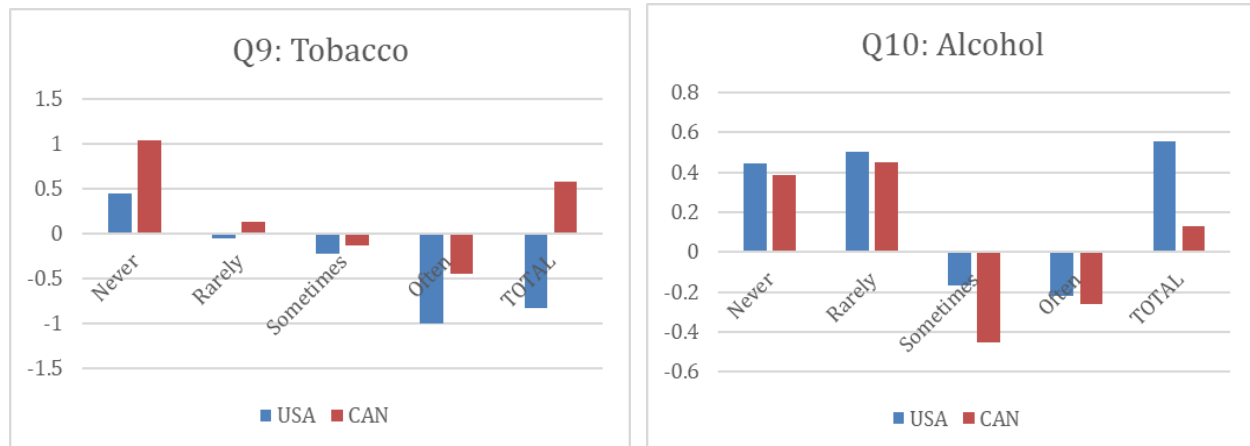
- Regarding survey questions 8, 17, 18, 19, 20, and 24, one can see that over 75% of the participants Sometimes to Often eat unhealthy foods; more than 40% exercise Rarely to Never; over 90% Rarely to Never meditate; while over 40% Rarely to Never get at least seven hours of sleep; yet, over 80% of the participants Sometimes to Often have contact with their family or friends; and 90% have Rarely to Never taken a sick day in the past three months (See Figure 2);

**Figure 2.**



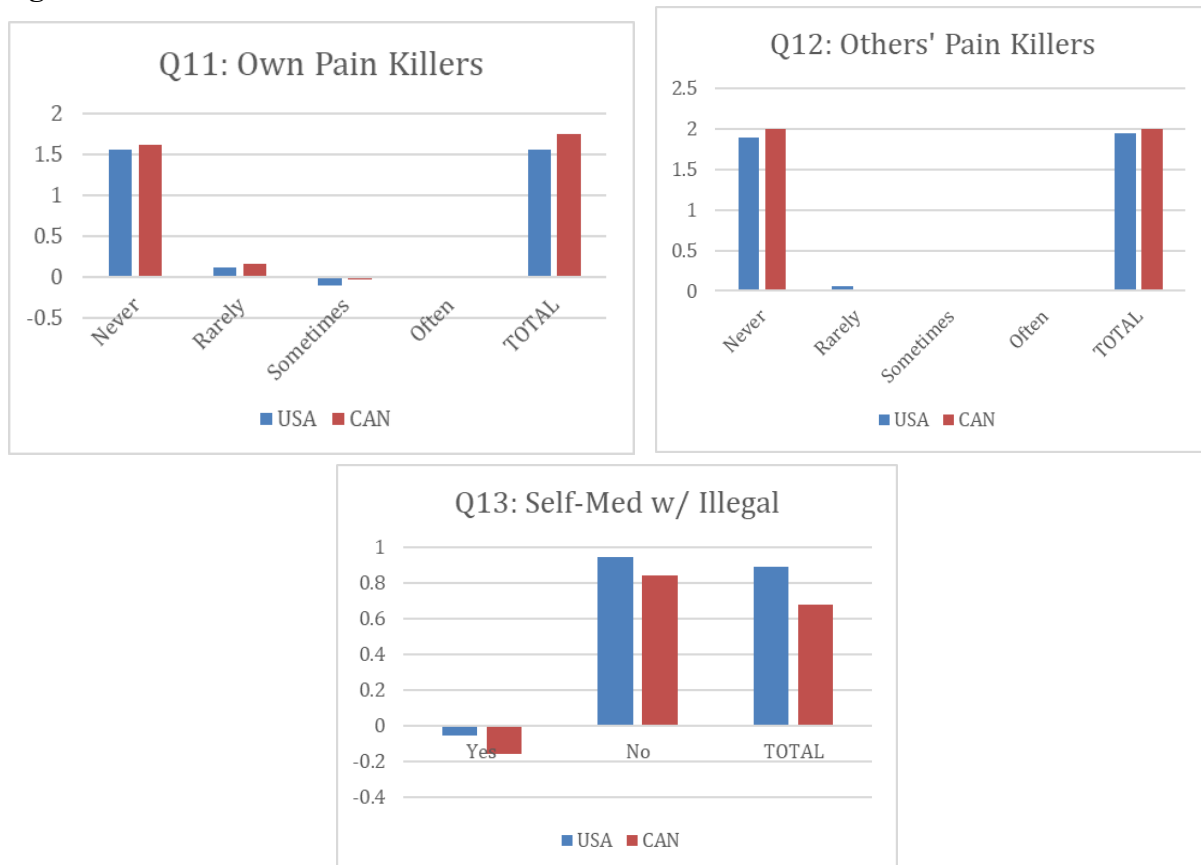
- Regarding survey questions 9 and 10, one can observe that a little less than 50% of the participants use tobacco products Sometimes to Often while almost one-third Sometimes to Often partake in alcohol (See Figure 3);

**Figure 3.**



- Regarding survey questions 11, 12, and 13, one can discern that over 90% of the participants Rarely to Never use prescription pain killers; nearly 100% Rarely to Never use someone else's pain killers; and almost 90% have not self-medicated with any type of illegal substance in the past three months (See Figure 4);

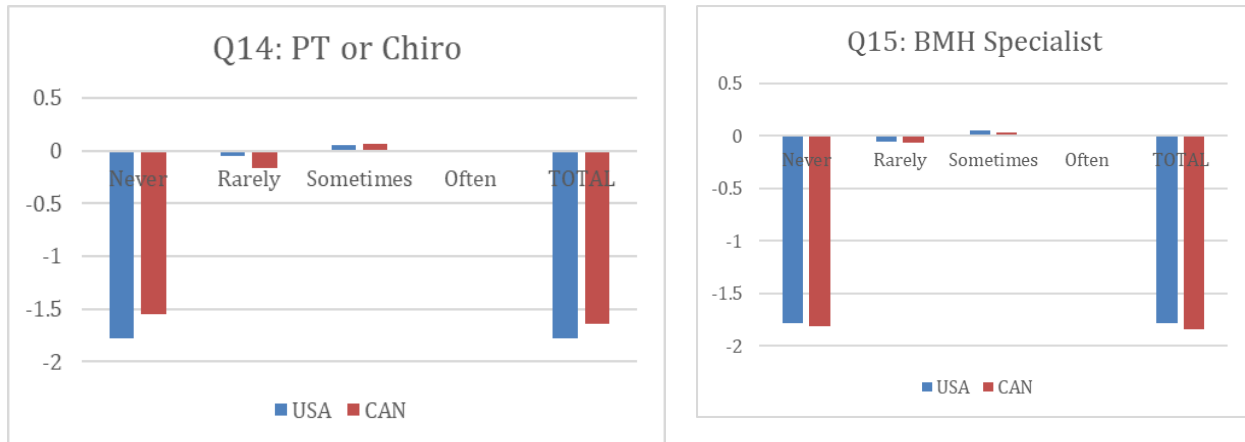
**Figure 4.**





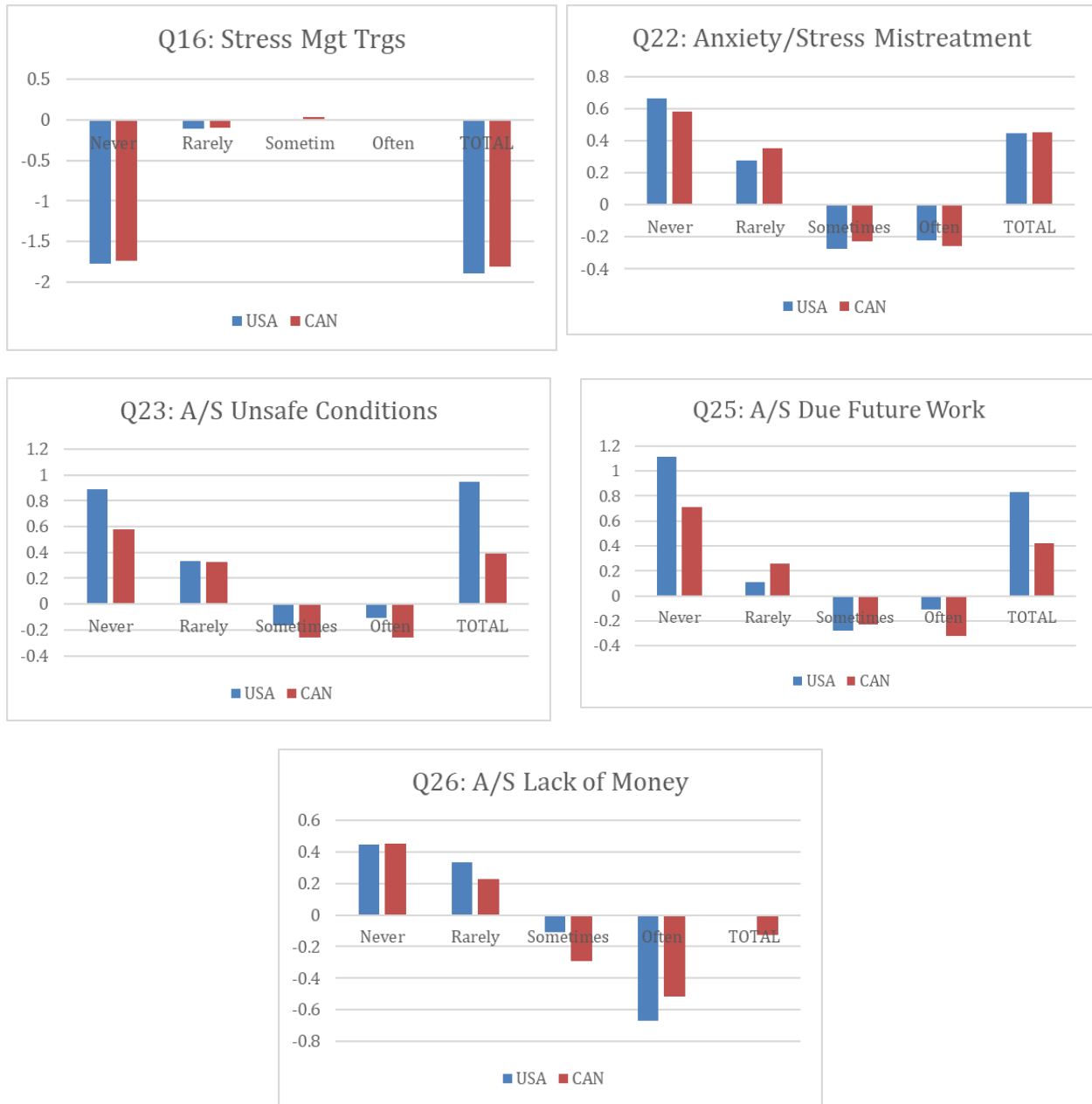
- Regarding survey questions 14 and 15, one can observe that well over 90% of the participants Rarely to Never have sought physical or mental forms of therapy (See Figure 5);

**Figure 5.**



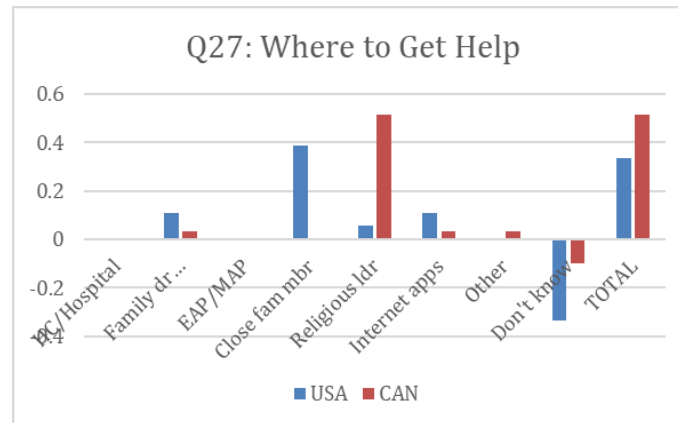
- Regarding survey questions 16, 22, 23, 25, 26, one can see that nearly 100% of the participants have not been exposed to stress management trainings; yet, over one-third are Sometimes to Often stressed by mistreatment within the apprenticeship program (i.e., jobsite, school, and/or union hall); over while 30% Sometimes to Often have anxiety concerning unsafe jobsite conditions; however, 90% of the participants indicate they Rarely to Never have taken a sick day in the past three months; meanwhile, over one-third of the participants are Sometimes to Often stressed over not knowing where they will be working in the near future; and slightly less than 50% are Rarely to Never stressed due to a lack of money to cover essentials (See Figure 6);

Figure 6.



- Regarding survey question 27, although almost 20% of the participants do not know where to go to find stress management assistance it is more revealing that 0.0% did not consider their local hospital/clinic or EAP/MAP (Employees Assistance Program/Member Assistance Program) as available resources (See Figure 7).

**Figure 7.**



## Discussion and Conclusion

With respect to the Research Question: When it comes to work-life balance, wellness, and well-being issues, do differences exist between post-secondary CTE/VET students in Canada and the USA? From an inferential statistical standpoint, there is no significant difference (See Appendix B). However, as noted above, one must not solely rely on the aggregated quantitative findings based on the T-test for independent samples. By clustering survey questions into distinct topics and performing a more granular-level analysis—via the FIG model—it was revealed that individual apprentices across the spectrum may not be receiving the attention required to establish work-life balance, wellness, and well-being in their own lives. Accordingly, with respect to research items covered within:

- **Figure 2:** Proper diet/exercise/sleep, learning meditation techniques, and staying socially connected are all strategies to help one cope positively with stress and become more resilient (Bennett, 2014). Aubrey (2019, para 1) claims, “About 11 million deaths per year are linked to poor diet around the globe.” Epstein (2008) indicates that insufficient sleep may result in a host of health consequences (i.e., obesity, hypertension, diabetes, etc.) and is also linked to reducing one’s life expectancy. Balanko (2016, Slide 19) maintains, “As consumers better understand H+W [health and wellness] through the metaphors of anxiety and stress, mindfulness [meditation] has emerged as central to all H+W.” Additionally, Cherry (2109, para. 2) says, “It is social support that builds people up during times of stress and often gives them the strength to carry on and even thrive.” And, Leslie, Aaker, and Schiffrin (2012, p. 1) found, “...that there are bottom line benefits happiness provides. These range from increased productivity, to the development of a greater number of products, to fewer sick days.”

- **Figure 3:** When it comes to substance use and mental health, the NIMH (n.d., para 1) notes, “Substance use disorder...changes normal behaviors and interferes with the ability to work, go to school, and to have good relationships with friends and family.” Strickland et al (2014, p. 107) posits, “Blue-collar workers, particularly those in the construction trades, are more likely to smoke and have less success in quitting when compared with white-collar workers.” Additionally, AHS (2010, p. 9) claims, “Workers in the construction industry also report higher than average rates of at-risk alcohol use, illicit drug use, and moderate to heavy smoking.” When it comes to wellness and well-being, Bennett (2014) suggests that these habits are all forms of negative coping strategies. Interestingly, Johnson and van Hattum (2019, Slide 26) declare, “Experiences of abuse and household dysfunction lead children and adolescents to engage in risky behaviors, like smoking, as a means of self-medicating or as an avoidant coping strategy.”
- **Figure 4:** Gregerson (2018, para. 1) declares, “Opioid use—and abuse—among construction workers has become the industry’s silent crisis. It frequently begins with pain, typically from jobsite-related injuries, including falls, or from tasks involving repetitive motion.” In Gaal’s article on opioids and the workforce (2018, p. 30), Armbruster declares, “Loss of life is the greatest but not the only devastating impact of the opioids epidemic. This crisis has also contributed to a smaller workforce, because OUD (opioids use disorder) is most prevalent in 18-30 years, who represent the emerging workforce.” Equally disturbing, the NSC (2019, p. 3) asserts, “Many people switching from prescription opioids to heroin do so because it is cheaper and easier to obtain when prescription opioids aren’t accessible—a scenario that could impact employees who are prescribed opioids due to a workplace injury....”
- **Figure 5:** Leung (2012, p. 256) proclaims, “Pain in human beings, whether acute or chronic, has both physical and psychological components.” To this end, Leung insists that medical professionals think more broadly and apply the analgesic platform model to all pain scenarios. This model at its lowest rung of the platform uses no medications to treat pain but offers a range of therapies—as stand-alone or in combination—including but not limited to physical therapy, relaxation, yoga, acupuncture, and chiropractic) that should be offered to the patient and adjusted accordingly. At the highest level of the platform, these aforementioned therapies would be used in addition to strong opioids.
- **Figure 6:** When it comes to mistreatment within the industry, Sweeney (2018, para. 4) says, “One-third of apprentices experience bullying, which can take the form of intimidation, verbal abuse, harassment, name-calling, or damage to their personal property. Wiebe and McCallum (1986, p. 436) found, “...hardy individuals appear to maintain better health practices while experiencing stress than do nonhardy individuals.” According to The LifeDojo Team (2017, para 7), “Some companies even consider employees’ financial health and the strength of their social networks

to be part of their overall well-being.” Tangentially, Swift (2018, para. 11) posits, “Employers large and small can make a meaningful difference as well by taking steps to remove the stigma of addiction, educating workers on the dangers of opioids through wellness programs and offering employee assistance programs to help ensure those suffering from addiction get the counseling and treatment they need.”

- **Figure 7:** Malacoff (2017) posits that forward-thinking companies are “... encouraging employees to make use of the resources available to them, whether that’s highlighting the company’s insurance coverage of mental health care, creating an open-door policy with HR to discuss how workplace stress can be lessened, or beefing up an employee assistance program.” However, when it comes to handling mental health issues in the workplace, Triplett (2015, para. 4) declares while, “... there is a legal obligation to provide a safe place for employees. You may find that there is a fine line between being supportive and invading an employee's privacy.” Most importantly, Albrecht (2014, para 2) professes:

*There are really four reasons why employees don't use EAP and I'll list them in the most-frequent order: they don't think it's confidential; they feel there is a stigma for reaching out for help (especially for some men, who see this as a weakness); they think they have to ask permission from their boss or HR; or they don't know it exists.*

## Recommendations

The findings in this pilot study indicate that gaps and barriers remain when it comes to work-life balance, wellness, and well-being for apprentices in the USA and Canada. In this author’s opinion, companies, unions, and their related training programs need to further exam how to address these gaps and barriers not merely for the sake of their apprentices’ well-being but in order to ensure construction remains a sought-after and living wage career path.

As noted by Jones, Braam, and Okun (2017):

*Young workers remain a vulnerable worker population in the United States. Integrating foundational OSH [occupational safety & health] competencies into CTE education is critical because...students who receive OSH training during schooling have fewer workplace injuries than those who do not.... (p. 42)*

Far too often, attention is focused solely on physical health and safety issues. Workers and students also need to know that they can safely confront mental health issues without stigma or retribution. In fact, the GWL (2019, para. 6) insists, “A workplace that pays attention to the psychological health and safety of its employees, in addition to their physical health and safety, is likely to have a healthier and more engaged workforce.” To this end, it is incumbent upon secondary CTE/VET programs to launch educational efforts that concentrate on workers’ work-life balance, wellness, and well-being issues not unlike their foray into teaching jobsite safety nearly 15 years ago. As such:

1. Industry sectors must embrace the importance of proactively attending to employees' mental health needs.

Companies' Human Resources Directors or Safety Directors should ensure that all white- and blue-collar workers are aware of the resources available for assistance: including not but limited to EAP/MAP, online BMH applications, and telemedicine. (See: <https://smallbiztrends.com/2015/12/workplace-wellness-programs-rise.html>; <https://blog.ifebp.org/index.php/three-ways-get-employees-use-eap>; or <https://www.npr.org/sections/health-shots/2019/09/09/746950433/telepsychiatry-helps-recruitment-and-patient-care-in-rural-areas>)

2. Secondary and post-secondary CTE/TVET programs should coordinate mental health training efforts with respective industry partners.

Design or adopt an approved program that teaches stress management techniques: including not but limited to diet, exercise, mindfulness, avoiding at-risk behaviors, anti-bullying, alternative pain management strategies, proper rest, prosocial behavior, and financial literacy. (See: <https://www.pbs.org/newshour/show/managing-school-stress-by-bringing-yoga-into-the-classroom>; <http://matesinconstruction.org.au/about/how-mic-works/>; or [https://www.unicef.org/publications/files/Violence\\_in\\_the\\_lives\\_of\\_children\\_and\\_adolescents.pdf](https://www.unicef.org/publications/files/Violence_in_the_lives_of_children_and_adolescents.pdf));

3. Stay abreast of the latest work-life balance, wellness, and well-being practices.

Become a Mental Health First Aid trainer, earn a certificate in suicide prevention training, or complete a wellness coach certification program. Each of these aforementioned designations require ongoing related education in order to renew the respective credential. (See: <https://www.mentalhealthfirstaid.org/become-an-instructor/>; or <https://qprinstitute.com/become-an-instructor>; or <https://www.nationalwellness.org/general/custom.asp?page=WorksiteWellnessCert>); and

4. Break the silence.

In order to eliminate the stigma associated with mental health, the opioids crisis, and/or suicide in the construction industry, workers must shed the "tough guy" image and talk about their own well-being while companies provide a safe culture to do so. (See: <https://www.buzzsprout.com/239763/1605091-suicide-prevention-awareness-for-construction-with-john-gaal-and-don-willey>; or <https://constructionmaguk.co.uk/a-building-crisis-uk-construction-workers-suicide-epidemic-is-a-quiet-danger/>; or <https://www.matesinmind.org/>).

In closing, when it comes to CTE/VET programs not addressing matters of BMH, work-life balance, wellness, and well-being, one must contemplate the words of Vance (2016, p. 255), "Are we tough enough to look ourselves in the mirror and admit that our conduct harms our children?"

### **Limitations**

This generalization of the findings within this pilot study are constrained by a number of factors, including but not limited to, small sample size ( $N = 49$ ), lack of gender and ethnic/race diversity in the two groups, lack of trade diversity, and lack of regional diversity. In addition, there was no attempt to control for various socioeconomic factors (i.e., annual income, education level, marital status, etc.) while examining the raw data. Therefore, care must be taken when applying these findings to situations that do not reflect the confines of this pilot study. To this end, further research on the topic of work-life balance, wellness, and well-being within the construction industry is required that takes the findings within this pilot study to the next level.

### **Acknowledgement**

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## Appendix A

### Work-Life Survey (US)

**As part of our commitment to help shape public policy and improve the physical and psychological health and safety for Carpenter Apprentices, we are conducting a short survey on work-life balance.**

**We encourage you to participate in this survey. Please be assured that all individual responses will remain completely confidential. No individual responses will be reported and no attempt will be made to identify individual respondents. Only aggregate data will be collected and used.**

**Your honesty and openness are greatly appreciated.  
This survey should take less than 15 minutes of your time.  
Thank you!**

#### *Survey Questionnaire*

*Please answer each question below.  
(Circle the **ONE** response that best suits you)*

#### **Part 1:**

**DEMOGRAPHICS**—In order to bundle the survey results, the following demographic questions will help identify our diverse Apprentice population and who may live and work in different regions of the country and in a variety of different job positions.

1. What is your gender?
  - a. Male
  - b. Female
  - c. Other
  
2. What is your age?
  - a. 16-19 years old
  - b. 20-24
  - c. 25-29
  - d. 30-34
  - e. 35-40
  - f. >40 years old
  
3. Which category best describes your race/ethnicity?
  - a. African-American
  - b. Latino
  - c. Native American
  - d. Pacific Islander
  - e. Asian
  - f. Caucasian
  - g. Other
  
4. In which state do you mainly reside?
  - a. Missouri
  - b. Illinois
  - c. Kansas
  - d. Other

*Please answer each question below.  
(Circle the ONE response that best suits you)*

5. Which setting below best describes where you live?
  - a. Urban
  - b. Suburban
  - c. Rural
  
6. How long have you been an apprentice in this program?
  - a. 0-11 months
  - b. 12-23
  - c. 24-35
  - d. 36-47
  - e.  $\geq$ 48 months
  
7. As an apprentice, what type of work do you mainly perform?
  - a. Residential Carpentry
  - b. Commercial Carpentry
  - c. Industrial Carpentry
  - d. Cabinetmaker
  - e. Millwright
  - f. Floor Layer
  - g. Other

**Part 2:**

**GENERAL**—This next part of the survey will help us understand the factors that impact your physical and mental health, and to build and promote programs that support a healthy life-style and safe work environment for Apprentices.

8. How often do you eat fried foods, sweets, and/or processed foods (i.e., fast foods, chips, soda, candy, lunch meat, etc.)?
  - a. Never
  - b. Rarely (1x per week)
  - c. Sometimes (1x per day)
  - d. Often (>1x per day)
  
9. How often do you use tobacco products (i.e., cigarettes, vaping, chew/dip, etc.)?
  - a. Never
  - b. Rarely (1x per week)
  - c. Sometimes (1x per day)
  - d. Often (>1x per day)
  
10. How often do you drink alcohol?
  - a. Never
  - b. Rarely (1x per week)
  - c. Sometimes (1x per day)
  - d. Often (>1x per day)

*Please answer each question below.  
(Circle the ONE response that best suits you)*

11. In the past 3 months, how often have you used your own prescription pain killers?

- a. Never
- b. Rarely (1x per month)
- c. Sometimes (2-3x per month)
- d. Often ( $\geq 1x$  per week)

12. In the past 3 months, how often have you used someone else's prescription pain killers?

- a. Never
- b. Rarely (1x per month)
- c. Sometimes (2-3x per month)
- d. Often ( $\geq 1x$  per week)

In the past 3 months, have you ever self-medicated with an illegal drug?

- Yes
- No

14. In the past 3 months, how often have you seen a Physical Therapist and/or Chiropractor?

- a. Never
- b. Rarely (1x per month)
- c. Sometimes (2-3x per month)
- d. Often ( $\geq 1x$  per week)

15. In the past 3 months, how often have you seen a Behavioral Health Professional (i.e., Psychiatrist, Psychologist, Licensed Therapist/Counselor, Social Worker, etc.)?

- a. Never
- b. Rarely (1x per month)
- c. Sometimes (2-3x per month)
- d. Often ( $\geq 1x$  per week)

**Part 3:**

**SPECIFIC**— For this part of the survey, we want to better understand the reasons and implications of why Apprentices feel the way they do about their job and their work environment, in which we can help improve awareness, enhance resilience and coping skills and create a supportive work environment.

16. In the past 12 months, how often has your company, union, and/or apprenticeship program offered training to help you deal with stress in your life?

- a. Never
- b. Rarely (1x per year)
- c. Sometimes (2-3x per year)
- d. Often ( $> 3x$  per year)

17. How often do you exercise (i.e., jog/run, bike, lift weights, etc.)?

- a. Never
- b. Rarely (1-2x per month)
- c. Sometimes (1-2x per week)
- d. Often (3-7x per week)

*Please answer each question below.  
(Circle the ONE response that best suits you)*

18. How often do you practice meditation-type techniques (i.e., mindfulness, yoga, worship, etc.)?
  - a. Never
  - b. Rarely (1-2x per month)
  - c. Sometimes (1-2x per week)
  - d. Often (3-7x per week)
  
19. How often do you get 7-8 hours of sleep?
  - a. Never
  - b. Rarely (1-2x per month)
  - c. Sometimes (1-2x per week)
  - d. Often (3-7x per week)
  
20. How often do you spend quality-time with your family, friends, and/or organizational members (i.e., sports team, church, fraternal club, Scouts, etc.)?
  - a. Never
  - b. Rarely (1-2x per month)
  - c. Sometimes (1-2x per week)
  - d. Often (3-7x per week)
  
21. How often are you able to provide constructive input on your jobsite, in a union meeting, and/or at school that is seriously considered and/or implemented?
  - a. Never
  - b. Rarely ( $\leq 1x$  per month)
  - c. Sometimes (2-3x per month)
  - d. Often ( $\geq 1x$  per week)
  
22. How often do you feel anxiety or stress due to demands and/or (mis)treatment on the job?
  - a. Never
  - b. Rarely ( $\leq 1x$  per month)
  - c. Sometimes (2-3x per month)
  - d. Often ( $\geq 1x$  per week)
  
23. How often do you feel anxiety or stress due to unsafe conditions on the job?
  - a. Never
  - b. Rarely ( $\leq 1x$  per month)
  - c. Sometimes (2-3x per month)
  - d. Often ( $\geq 1x$  per week)
  
24. In the past 3 months, how often have you taken a sick day from work due to stress or anxiety?
  - a. Never
  - b. Rarely ( $\leq 1x$  per month)
  - c. Sometimes (2-3x per month)
  - d. Often ( $\geq 1x$  per week)

*Please answer each question below.  
(Circle the ONE response that best suits you)*

25. How often do you feel anxiety or stress due to not knowing which jobsite you will be working on 3 months from today?
- Never
  - Rarely ( $\leq 1$ x per month)
  - Sometimes (2-3x per month)
  - Often ( $\geq 1$ x per week)
26. How often do you feel anxiety or stress due to a lack of money to cover your basic needs (i.e., food, rent, transportation, child care, etc.)?
- Never
  - Rarely ( $\leq 1$ x per month)
  - Sometimes (2-3x per month)
  - Often ( $\geq 1$ x per week)
27. I would go to the following people or place for help if I was under stress or dealing with anxiety:
- Health Center/Hospital
  - Family doctor/Psychologist/Psychiatrist
  - Company's Employee/Union Member Assistance Program
  - Close family members
  - Religious/spiritual advisor
  - Internet/mobile self-help apps
  - Other
  - Don't know

## Appendix B

### FIG Scores

Question	USA n=18	CAN n=31	
8	-1.1111	-0.8065	
9	-0.8333	0.5806	
10	0.5556	0.129	
11	1.5556	1.7419	
12	1.9444	2	
13	0.8889	0.6774	
14	-1.7778	-1.6452	
15	-1.7778	-1.8387	
16	-1.8889	-1.8065	
17	0.1667	0.4516	
18	-1.5556	-1.4194	
19	0	0.4194	
20	1.1111	1	
21	0.1667	-0.0323	
22	0.4444	0.4516	
23	0.9444	0.3871	
24	1.4444	1.4194	
25	0.8333	0.4194	
26	0	-0.129	
27	0.3333	0.7097	
<b>TOTAL</b>	<b>1.4443</b>	<b>2.7095</b>	
STD DEV	1.155515	1.094107	
Mean	0.072215	0.135475	
Variance	1.335215	1.197071	
n	18	31	
N			49
X <sub>1</sub>	0.072215		
X <sub>2</sub>		0.135475	
t			-0.005
t <sub>crit</sub> (.05, 47)one tail			~1.68

*Accept the null hypothesis*

*There is no significant difference*



# **Publication Guidelines for the *International Journal of Vocational Education and Training***

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.

The Editorial Board passed a resolution requiring membership in IVETA in order to publish in the Journal, with effect from Volume 14.2. The Journal publishes feature articles on research, theory, and practice broadly related to international vocational education and training. The largest section of the Journal is devoted to empirical research articles. General articles and research manuscripts submitted for publication should be between 1,200 and 5,000 words in length and should adhere to rules in the most recent edition of the Publication Manual of the American Psychological Association (APA) with the exception of placing tables in-column in the text where you prefer them to appear. Articles should deal with some relevant aspect of educational opportunity such as educational research, evaluation, instruction, teaching methods, policy making, or theoretical discourses related to education and training.

In addition, the Journal solicits book, test, and computer hard/software reviews (500-700 words) and research in brief manuscripts (800-1,200 words) with similar publication goals. Authors interested in submitting a manuscript are required to follow the APA format as noted above.

## **Style and Submission Requirements**

**Copies.** Submit electronic copies to: <https://iveta.global/submit-your-abstracts-and-articles/> Or submit manuscripts directly to the editor via email at [lsteinke@iveta.global](mailto:lsteinke@iveta.global)

**Style.** Adhere to the most recent APA edition to format your manuscript. Please remember the exception: Place any tables or figures in-column where they should appear. Any paper that does not otherwise follow APA style will not be considered. Make certain that documentation (reference) format rules are double-checked. In addition, avoid footnotes, and do not include your name or affiliation on any page after the title page. No more than 5% of a paper's text should be direct quotations. Insert only one space after punctuation at the end of sentences.

**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.

**General Articles and Research Manuscripts.** General articles and research manuscripts must be between 1,200 and 5,000 words long, or not more than 25 typed pages (double-spaced). Authors should keep tables and figures to a minimum and include them in-column at the appropriate point(s) of insertion. Emphasis is placed particularly upon manuscripts that are research-oriented.

**Cover Page and Title.** Authors must include a removable cover page that is attached to each manuscript. This cover page should include the title of the manuscript and the name, address, phone number, email address, and institutional affiliation of each author. The title should be no more than 12 words.

**Abstract.** An abstract describing the manuscript should be included on a separate sheet. The abstract must be less than 120 words. Please follow APA guidelines when writing the abstract.

**Book Reviews.** Book reviews should be between 500 and 750 words in length and contain the following information: complete bibliographic entry, including cost (hard- and softcover, if available); the thesis of the book; a brief description of the argument (main ideas); sample passages quoted and/or commentary on writing style; shortcomings and strengths; intended audience (whom the book will most benefit in the international education and training community); your opinion of the book; and what you think the book contributes to the international vocational education and training community.

**Test Reviews.** Test reviews should be between 500 and 750 words in length and contain the following information: complete bibliographic entry, including cost; the main purpose(s) of the test; a brief description of the administration and time; shortcomings and strengths; intended audience (whom will the test most benefit in the international education and training community); your opinion of the test (citing similar tests and the pros and cons relative to those tests); and what you think the test contributes to the international vocational education and training community.

**Review Process.** Once your manuscript has been received, it will be checked for conformity to style and Journal requirements, then forwarded to up to three peer review readers who will read your manuscript and make recommendations as to whether to accept or reject it for publication. Unless the manuscript is inappropriate for review due to length and/or topic, manuscripts submitted to the *International Journal of Vocational Education and Training* are anonymously reviewed by a peer review reader group as noted above. You will receive a publication decision within a reasonable amount of time (normally 3 to 5 months). Do not submit manuscripts concurrently under consideration by another publication or manuscripts that were previously published. Indicate a statement on the cover page is the manuscript is being reviewed or has been submitted for publication elsewhere.

## Call For Papers

*The International Journal of Vocational Education and Training (IJVET)* accepts original manuscripts from scholars and practitioners worldwide focusing on Technical Vocational Education and Training (TVET). Authors wishing to have articles reviewed and published in the next volumes are encouraged to submit their manuscripts to: <https://iveta.global/submit-your-abstracts-and-articles/>, or submit directly to the editor at [lsteinke@iveta.global](mailto:lsteinke@iveta.global)

## Topic Areas of Interest

In general, *IJVET* accepts articles on all general aspects of TVET, however, the journal welcomes manuscripts that meet the general criteria of significance and scientific excellence, and will publish: original articles in basic and applied research, case studies and critical reviews, surveys, opinions, commentaries and essays including, but not limited to the following topic areas:

- Information and communication technologies and TVET
- Comparative studies in TVET
- Financing TVET
- Implementation and evaluation of TVET programs or education
- New and emerging practices in TVET
- TVET as continuing or lifelong Learning
- Transfer of Training
- Formal, Informal and Non-formal TVET
- TVET policies at local, national, and international levels
- Occupational competencies and TVET
- National Vocational Qualifications and Occupational Standards
- Occupational Certification, Licensing, Accreditation, and Micro Credentialing
- Cost Effectiveness and Quality Based TVET
- Instructional methods and TVET

For guidelines on submitting manuscripts, please visit:

<https://iveta.global/publications/the-iveta-journal-ijvet/>

## Editorial Board Members

*IJVET* is also seeking members willing to serve as reviewers for the journal. If you are interested in joining our team of reviewers please, send your resume to [lsteinke@iveta.global](mailto:lsteinke@iveta.global)