

Development and Validation of Scales to Measure Capacity Building, Economic Empowerment, and Barriers to Economic Empowerment

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Abstract

To measure capacity building, economic empowerment, and barriers to economic empowerment among youths involved in vocational skills development some scales were designed by the researcher while other scales were used either in their original or modified versions. The paper presents the scales developed by the researcher to measure these variables. Scales measuring the participants' skills acquisition, economic empowerment, and barriers to economic empowerment were designed by the researcher. Training satisfaction scale was modified to measure the participants' perception of training received. Self-esteem, perceived control, and personal growth initiative scales were used in their original versions. Using a factorial analysis, the cronbach's alpha of the developed instruments achieved a reliability level at or above .70. The developed scales have contributed to knowledge as they can be used to measure future research questions. It is hoped that several research directions could be pursued using the developed scales.

Keywords: Skill Acquisition; Economic Empowerment; Scales; Barriers; Factorial Analysis

1. Introduction

The study focused on designing scales to measure Capacity Building, Economic Empowerment, and Barriers to Economic Empowerment. Pilot testing was conducted among youths involved in vocational skills development designed by the National Directorate of Employment (NDE) of Nigeria. The purpose was to identify how the participants would respond to the items based on their perceptions of the study variables so that scales' items could be generated that would be relevant, easily understood, and consistent with methodological rigour. Structured questionnaire served as the major instrument of data collection, with closed-ended questions, which offered respondents multiple choice options that described their opinions to a statement or item. Focus group discussion (FGD) complemented the designing of the questionnaire, as a means of exploring respondents' views on the study topic.

While some instruments were used in their original and modified versions others were however designed by the researcher to measure some of the study variables. The scales that were

designed by the researcher include: perceived skill acquisition scale, barriers to economic empowerment measure (BEEM), and perceived economic wellbeing scale (PEWBS). The recommended scientific procedures for scales development and validation are discussed in this paper. Also presented in this paper are factorial analyses of the scales. The demographical information of the study participants is also discussed. The standardized and modified instruments are not presented as they are already known to the academic audience. Capacity building in the main study has five components, namely skill acquisition, training, perceived control, personal growth initiative, and self esteem.

2. Methodology

A convenient sampling technique was used to select 50 participants who share very similar characteristics with the study population; and were drawn proportionately from the following skill areas: electrical installation, auto mechanics, computer operations, fashion design, catering, and interior decoration. The questionnaires were administered to the fifty participants so as to determine their suitability and standardization for the purpose of the main study, and to establish the psychometric properties of the scales– both for those in their original and modified versions and those that were developed by the researcher. This was deemed very necessary since some of the measures were being used for the first time among a Nigerian sample. The measurement scales adapted and developed for the study were measured on a 5-point Likert scale, with a score of ‘1’ representing “*strongly disagree*”, and a score of ‘5’ representing “*strongly agree*”. FGD played a complementing role to the study’s quantitative approach as it offered insights into the designing of appropriate scientific measures used in the study. An exploratory dual-moderator focus group was used in the study to collect in-depth information from a convenient sample size which represents the population of interest. FGDs were held in three different groups of six each, in compliance with Bedford’s and Burgess’ (2001) stance that FGD is a meeting of a total number of four to eight people that are gathered to discuss a topic chosen by the researcher.

3. Demography

The average age of participants was 27.18 years (23-24years; standard deviation = 2.783). Thirty-two (32, 64%) were males; twenty-four (24, 75%) of which are single, while Eight (8, 25%) are married. Eighteen (18, 36%) were females – ten (10, 55.6%) of which are single, while eight (8, 44.4%) are married. Thirty-four (34, 68%) are single, while sixteen (16, 32%) are married. Twenty-five (25, 50%) of the participants hold Senior Secondary School Certificate; Fifteen (15, 30%) of the participants holds a certificate in Technical/Vocational Study; Eight (8, 16%) of the participants hold a National Diploma, while Two (2, 4%) of the participants hold a University Degree. Thirty-one (31, 62%) are Self-employed, Nineteen (19, 38%) are employed by an organization or a company; Seven (7, 14%) are trained in Electrical Installation, one (1) of which is a female. Six (6, 12%) are trained in Auto-Mechanic. Seven (7, 14%) are trained in Interior Decoration, three (3) of which are females. Thirteen (13, 26%) are trained in Catering Services, ten (10) of which are females. Seven (7, 14%) are trained in Fashion Design, three (3) of which

are females; Eight (8, 16%) are trained in computer operations, one (1) of which is a female; and Two (2, 4%) are trained under the category classified as others by the researcher.

4. Development and Validation of Scales

4.1 Perceived Skill Acquisition Scale

The perceived skill acquisition scale was exclusively developed by the researcher to measure the youth's skills acquisition. The procedure for the construction of the scale is discussed as follows:

4.1.1 Generation Of Items

In order to capture and operationalize perceived skill acquisition the design of a scale to measure the concept became necessary. During the FGD session, participants identified what they perceived to be indicators of the fact that they have been well trained and have acquired the needed skills to succeed in their chosen vocations. In addition, they were asked to write out how they would be sure that they have acquired the needed skills. Therefore statements like: "I would be able to do my work effectively if I have acquired enough skills", "I would be able to manage my business successfully if I do have adequate skills", were provided.

Second, these statements were re-worded in such a way that they could be responded to using the Likert-response format, that is, "strongly agree" to "strongly disagree". This stage of item generation led to an item pool of 15 statements, among which are: "The skills acquisition helped me to improve my work ability"; "I have the skill to manage my business successfully"; "I am able to use my skills in my current position", and so on. This was necessary so as to modify and perfect the wordings of items for the scale (Sunmola, 2001).

Next, reliability analysis deleted four items to leave a total of eleven items. The internal consistency index as signified by the cronbach alpha is .897. To establish the content validity, reference to literature was made for this purpose. Therefore, literature review and the content analysis of discussions from the focused group discussion with pilot participants were employed to generate items for the scale (Okurame, 2002).

To determine the content validity of the items, they were summarily highlighted as factors, and given to five trainers engaged by National Directorate of Employment to rate. A factor that did not receive up to 80% endorsement was dropped from the items. Sunmola (2001) recommended the use of expert opinion in the design of instruments, while Nunnally (1978) and Anastasi and Urbina (1997) suggested the use of expert rating for content validation.

Consequently, an item pool of eleven resulted from the procedural techniques employed above. Using a 5-point Likert-type response format, the worded items were put in a questionnaire, and respondents were asked to indicate the extent to which they agree or disagree with the statements which describe certain aspects. See appendix A for the 11-item

scale. This was administered to the pilot participants. The internal consistency as shown by cronbach alpha was desirable at 0.868.

In order to carry out a factorial analysis on the data, to test whether the scale is one-dimensional or multidimensional, the *Bartlett's test of Sphericity* was done to test whether the correlation matrix is an identity, and to show that variables (items) are related and therefore suitable for structure detection. The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was also applied on the data. The statistics test whether the partial correlations among items are small, that is, whether the proportion of variance accounted for by factors is large enough and might be caused by underlying factors. These statistical procedures are necessary to determine the suitability of data for factorial analysis.

To determine the suitability of the perceived skill acquisition scale for factor analysis, the Kaiser-Meyer-Olkin measure of sampling adequacy was conducted and this was found to be high at 0.762. Similarly the Bartlett's Test of Sphericity revealed that the sample population correlation matrix is not necessary an identity at $X^2 = 225.093$, $P < 0.0001$; which indicates that the scale might not be one dimensional (Sunmola, 2001). Result output from the factor analysis using the Varimax (Rotation) method shows that items loaded under four (4) factors – Items 2, 3, and 4 loaded highest on factor 1 with an Eigen value of 2.385; Items 8, 9 and 11 loaded highest on factor 2 with an Eigen value of 1.984; Items 1, 6 & 10 loaded highest on factor 3 with an Eigen value of 1.960; while Items 5 and 7 loaded highest on factor 4 with an Eigen value of 1.834. The mean score for this scale is 48.54 with a standard deviation of 5.15. Table 1 below shows the psychometric properties of the scale.

Table 1: Perceived Skill Acquisition Scale (Psychometric Properties)

Items	Factor Loadings				Item-Total Correlation	Cronbach α If Item Deleted
	1	2	3	4		
1	.277	-.059	.673	.432	.537	.844
2	.790	.182	.336	.050	.665	.833
3	.706	.229	-.062	.479	.614	.838
4	.836	.352	.125	.076	.692	.831
5	.157	.017	-.001	.907	.367	.855
6	.541	-.006	.630	-.018	.515	.846
7	-.002	.359	.298	.704	.516	.846
8	.090	.562	.512	.084	.510	.846
9	.238	.830	.147	.025	.542	.844
10	.026	.309	.777	.017	.438	.852

11	.322	.736	.021	.288	.600	.840
Eigen Value	2.385	1.984	1.960	1.834		
% of Variance	21.679	18.037	17.818	16.670		

4.2 Barriers to Economic Empowerment Measure

The barriers to economic empowerment measure (BEEM) were designed to measure barriers or obstacles that impede the youths' economic wellbeing. The procedure for its construction is as follows:

4.2.1 Generation of Items

During the focus group sessions held with few participants, factors identified as constituting barriers to economic empowerment were worded to form statements, which the pilot sample responded to. Thus, items for this measure were generated from content analysis of the focus group discussions. The FGD participants highlighted factors that constitute barriers to the thriving and expansion of their businesses. The eleven-item statements were followed with 5-point Likert format, asking participants to indicate the extent to which they agree or disagree with the statements. Responses ranged from "strongly disagree" (1) to "strongly agree" (5), such that lower scores reflect less barriers to economic empowerment and higher scores reflect the opposite— more barriers to economic empowerment. From these eleven items, statements were generated and worded to form the barriers to economic empowerment scale. Participants pointed out that access to credit facilities, insufficient personal funds, logistics and transportation difficulties, absence of further training on new technology, high cost of equipments, lack of government support facilities such as electricity supply and inability to repay loan constituted constraints to them. All these factors were worded to form items on the scale. The cronbach's alpha for the measure was .967. See appendix B for the scale.

To further establish the construct validity of this measure via items analysis, a factor analysis was carried out on the items. The result of the factor analysis shows that items loaded under two factors which had Eigen values exceeding 1.00. Items 1, 2, 3, 4, 5, 7, and 10 loaded higher on factor 1 with Eigen value of 5.018, while items 6, 8, 9, and 11 loaded higher on factor 2 with Eigen value of 3.825. The mean score for the scale is 32.92 with a standard deviation of 12.15. Table 2 below shows the psychometric properties of the scale.

Table 2: Barriers to Economic Empowerment Scale (Psychometric Properties)

Items	Factor Loadings		Item-Total Correlation	Cronbach α If Item is Deleted
	1	2		
1	.840	.377	.854	.950
2	.865	.287	.801	.952
3	.895	.262	.812	.952
4	.741	.521	.874	.949
5	.880	.287	.822	.952
6	.327	.827	.741	.954
7	.645	.514	.783	.953
8	.282	.778	.670	.956
9	.255	.881	.724	.954
10	.715	.550	.874	.949
11	.512	.739	.840	.950
Eigen Value	5.018	3.825		
% of Variance	45.622	34.770		

4.3 Perceived Economic Well-Being Scale

The perceived economic well-being scale (PEWBS) was developed by the researcher to measure youths' economic empowerment, which is the outcome variable. The procedure for its construction is as follows:

4.3.1 Generation of Item Pool

The FGD participants were asked to write down 15 items or statements which they consider to signify economic well-being (empowerment) among individuals in their trade. A content analysis of these statements was done and trimmed down to 25 statements. After a careful literature review to consider what constitute economic well-being, for instance, the assertion that economic well-being is the capacity of people to be empowered towards securing livelihood and self-reliance (Schultz, 1994), it became clear that these suggestions serve as indicators in their own right. The statements were sent to two Economics lecturers at the Department of Economics, University of Abuja, Nigeria, for expert opinion and rating on the statements and suggestions on what constitute economic well-being. The items were retained in the measure if considered an appropriate indicator of economic well-being. Any item not endorsed by either of the expert was dropped from the item pool. Rationale for this resulted from the suggestion by Nunally (1978) that the use of expert rating technique is a suitable strategy for attaining content validity. With the use of a five-point Likert-response format, the emerging item pool consisting of 25 items was put in a questionnaire format and administered to the sample of the pilot study.

In order to establish the psychometric properties and improve the construct validity of the measure, the items on the scale had to be subjected to item analysis, based on how participants of the pilot study responded to the statements, as recommended by Mills, Kroner and Forth (2002), McCreary and Thompson (2006), and Rust and Golombok (1985). Thus, to consider an item suitable for the scale, the following were strictly adhered to:

1. Items that were endorsed by over 90% or less than 10% of the respondents – either “agree” or “disagree” were dropped from the scale as suggested by Mills, Kroner and Forth (2002).
2. An item’s general contribution to the internal consistency coefficient as indicated by cronbach alpha when such item is removed or added to the scale. This contribution is observed under the cronbach Alpha “If Item is Deleted column” to determine the homogeneity it adds to the scale. That is, the Cronbach Alpha value is examined for improvement with and without the item.
3. The Item’s Corrected Item-Total Correlation coefficient must be at least 0.3 as recommended by McCreary and Thompson (2006) for initial psychometric analysis. Although, Rust and Golombok (1985) suggested a value not less than 0.40. A high index which is the goal suggests that the item is going in the same direction with the entire scale.

Based on the above criteria, 23 items were selected from the original pool for the final scale. These items were designed on a Likert-type scale ranging from strongly agree (5) to strongly disagree (1). It has an item mean potential range of 3.643; an inter-item correlation minimum of .002; a maximum of .910; an inter-item mean .521; and a least item-total correlation of .366. The alpha reliability of the 23 items that were eventually chosen was .962 and the split-half reliability using the Spearman-Brown formula produced a coefficient of .893. A high score on the scale indicated a high level of perceived economic well-being.

To determine the suitability of the perceived economic well-being scale for factor analysis, the Kaiser-Meyer-Olkin measure of sampling adequacy was conducted and this was found to be high at 0.767. Similarly the Bartlett’s Test of Sphericity revealed that the sample population correlation matrix is not an identity at $X^2 = 1346.3$, $P < 0.0001$, which indicate, that the scale might be multi-dimensional (Sunmola, 2001). For the 23 items, a principal component factor analysis using the Varimax rotation yielded three factors for the Perceived Economic Well-Being Scale. The three factors loaded with Eigen values exceeding 1.00. Table 3 below shows the psychometric properties of the scale. Note that there were some overlaps with some of the items loading high under more than one factor but the highest loading was chosen.

Table 3: Perceived Economic Well-Being Scale

Items	FACTOR LOADINGS			Item-Total Correlation	Cronbach's α if item is deleted
	1 Income	2 Economic Quality Of Life	3 Business Growth		
1	.832	.345	.075	.728	.959
2	.840	.307	.158	.754	.958
3	.172	.222	.761	.579	.960
4	.851	.357	.032	.731	.959
5	.833	.338	.061	.719	.959
6	.375	.763	.201	.781	.958
7	.240	.359	.745	.705	.959
8	.253	.193	.830	.646	.960
9	.841	.368	.176	.806	.958
10	.768	.287	.313	.773	.958
11	.837	.284	.303	.811	.958
12	.842	.278	.180	.746	.959
13	.268	.791	.287	.776	.958
14	.311	.786	.228	.769	.958
15	.043	.160	.814	.477	.962
16	.339	.834	.048	.727	.959
17	.287	.801	.102	.700	.959
18	.307	.836	.190	.778	.958
19	.362	.670	.254	.738	.959
20	.263	.128	.839	.610	.960
21	.360	.695	.323	.787	.958
22	.264	.667	.437	.767	.958
23	-.050	.103	.765	.366	.962
Eigen Value	6.678	6.336	4.647		
% of Variance	29.033	27.546	20.206		

To establish a convergent validity for the perceived economic well-being scale there was the need to correlate the developed scale with Personal Well-Being Index (4th edition) by Cummins and Lau (2006) and Quality of Life Index by Ferrans and Powers (1992). The two measures showed a positive relationship of .597 and .606 respectively with the Perceived Economic Well-being scale. To establish the divergent validity the scale was correlated with the scale of perceived occupational Stress by Andrew Smith (2000) and was found to have a significant negative correlation of .57. The scale had a mean score of 82.98 and a standard deviation of 12.23 using the pilot sample. The mean value of the PEWBS for the main study is 76.96, a standard deviation of 21.838, variance of 476.910 and a range of 90. A minimum and maximum

score of 24 and 114 respectively were obtained on the measure. See appendix C for the perceived economic wellbeing scale.

5. Instrumentations

Perceived skill acquisition is one of the components of capacity building investigated in the study. It was measured using the perceived skill acquisition scale; and has a total of 11 items. Perceived economic wellbeing scale measured participants' economic empowerment in three dimensions, namely, income, business growth, and quality of life. A total of 23 items was designed for this section. Finally, barriers to economic wellbeing scale which measured the barriers or obstacles that impede the participants' economic empowerment has a total of 11 items. Considering the social characteristics of the target population of the study careful consideration was given to the designing of the questionnaire in order to generate useful and relevant information. The questions were closed-ended questions, which offered respondents multiple choice options that described their opinions to a statement or item. And the questions were numbered and ordered in a way that is logical and comprehensible to the respondents, with similarly themed questions grouped together. See appendix for details of the questionnaires.

6. Conclusion

In developing and validating the research scales extensive guidelines and steps regarding scale development were strictly adhered to in all the development process. The study was however limited to a small sample size of participants who participated in the vocational skill development scheme; although the author has since used the scales on a larger sample size. It is hoped that several research directions could be pursued using the developed scales. Future studies should employ the scales in examining other research questions, hoping that they yield useful insights. The author also welcomes constructive comments from the academic audience.

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Appendix 1. Perceived Skill Acquisition Scale

Below are statements that you may agree or disagree with. Using the 1-5 scale, indicate how much you agree or disagree with each statement by ticking the corresponding box.

No	Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	I mastered the skills needed to set up my own business					
2	I received adequate skills to do my job well					
3	Information I needed to establish my business was provided					
4	I acquired adequate skill from my trainers					
5	I am capable of using my acquired skills to meet my needs					
6	I gained confidence in ability to use my skills					
7	I am able to use my skills in my current position					
8	The skill acquisition helped to improve my work ability					
9	I achieved my goals through the skills training					
10	I have the skill to manage my business successfully					
11	I am confident of my abilities to succeed at work using my skills					

Appendix 2. Barriers to Economic Empowerment Measure (BEEM)

Below are statements that you may agree or disagree with. Using the 1-5 scale, indicate how much you agree or disagree with each statement by ticking the corresponding box.

No	Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	Lack of credit for business start-up was a barrier to my business					
2	Lack of government support facilities was a barrier to my business					
3	Lack of access to micro credit was a barrier to my business					
4	Lack of personal funds was a barrier to my business					
5	Lack of technology to improve work was a barrier to my business					
6	Limited equipments to work was a barrier to my business					
7	Inadequate information and advice on how to start a business was a barrier to the growth of my business					
8	Inadequate managerial skills constituted a barrier to my business					
9	Repayment of loan constituted a barrier to my business growth					
10	Absence of further training constituted a barrier to my business					
11	Transportation difficulties constituted a barrier to my business					

Appendix 3. Perceived Economic Wellbeing Scale (PEWBS)

Below are statements that you may agree or disagree with. Using the 1-5 scale, indicate how much you agree or disagree with each statement by ticking the corresponding box.

No	Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	The condition of my economic life is better than my previous condition					
2	I am financially self-reliant					
3	I am satisfied with my financial progress since starting up my business					
4	So far my income meets my basic needs					
5	Since becoming employed I am better-off financially					
6	My standard of living has improved as a result of my business					
7	My business is growing continuously					
8	I am able to meet the demands of most of my customers (clients)					
9	I feel my income is fair based on the work that I do					
10	I regard my income as appropriate					
11	I generally feel happy with my economic life					
12	Income from my business sustains me					
13	My business transformed my life					
14	I have a decent accommodation					
15	I can afford most of the equipments needed for my business					
16	I pay my utility bills (e.g., electricity & water)					
17	My medical care expenses are catered for by me					
18	I eat good food					
19	I can support family members					
20	I do not owe any person or bank					
21	My business has improved my quality of life that I live					
22	I can sustain my improved living condition without depending on anyone					
23	My business does not owe anyone					