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Research Paper

Implementing Employability Skills Module in Aluminium Fabrication And Glazing Work In Nigerian Technical Colleges

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Abstract

Facilities are essential ingredients for an all-round implementation of any skill-based program in Technical and Vocational Education and Training. In this study, we want to ascertain the facilities that will be appropriate for implementing the employability skills module in aluminum fabrication in Nigerian technical colleges. Further, we employed Confirmatory Factor Analysis (CFA) to reveal that the identified facilities are appropriate for implementing the employability skills module in aluminum fabrication having fulfilled all the conditions for convergent, construct, and discriminant validity. Based on the findings of the study, it was recommended that the identified facilities be given priority and procured for the successful implementation of the employability skills module in aluminum fabrication and glazing work.

Keywords *technical colleges; employability skills; aluminum fabrication; facilities*

INTRODUCTION

Technical colleges are TVET institutions where recipients are exposed to skill-based programs targeted toward acquiring relevant knowledge and skills in different trades for self-reliance and employment in the world of work. Technical colleges as training institutions enable students to acquire relevant and adequate knowledge, skills, and attitudes for employment in various occupations under the tutelage of qualified teachers (Nwachukwu, Bakare & Jika, 2011). Technical colleges are part of the Nigerian TVET institutions under the supervision of the National Board for Technical Education (NBTE). The NBTE ensured that all academic programs across the technical colleges enjoy periodic accreditation and curriculum development.

The National Business and Technical Examinations Board (NABTEB) is responsible for the examination and certification of the occupational trades offered by the technical colleges. Hence, NBTE (2011) stated that quality in the TVET sector is maintained through a process of curriculum development, accreditation of programs, and enforcement of carrying capacities of institutions for accredited programs. This is undertaken through curriculum development, review, and inspection visits by teams representing the major stakeholders in the specialized areas including representatives of professional registration councils, employers of labor, academic staff from universities, and professional peers from the polytechnics.

In addition, Technical colleges are TVET institutions in Nigeria saddled with the responsibility of equipping recipients with employability skills (FGN, 2013). However, the technical colleges that are

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mandated to produce skilled craftsmen in different occupations do not accommodate Aluminium Fabrication and Glazing Work (AFGW) as observed by the researcher, despite the opportunities that could be derived from it. AFGW offers great opportunities for trainees due to the wide acceptance of the use of aluminum and glass for doors, windows, arcs, shelves, and wardrobes in both private and commercial buildings. It has also been carefully observed that modern houses are now adorned with aluminum and glass products due to their uniqueness and aesthetic value. Aluminum receives wide acceptance the world over as its usage spans different areas of human endeavor such as schools, private and commercial buildings, and all manner of buildings around the globe (Muhammed, 2010). The use of aluminum in business and office complexes, buildings, theatres, and auditoriums is very extensive for functional as well as decorative purposes. Similarly, in residential buildings, aluminum doors, windows, railings, and grill works are used extensively. Textile shops and other trading shops in lighter materials are equipped with shelves made of aluminum for stacking purposes.

Aluminum has many properties such as light weight, strength, resistance to corrosion, durability, easy fabrication, attractive appearance, and easy maintenance that make it a popular material for use in modern buildings (Muhammed, 2010; Capra, 2012; Silver, 2018). Aluminum fabricated and anodized items like doors, windows, railings, staircases, shelves, and ladders among others are being increasingly used in modern constructions on considerations of durability and appearance. In the present time, theatres, restaurants, hotels, shopping complexes, office premises, and other luxurious buildings are quickly replacing wooden materials with aluminum-fabricated items. The consumption of aluminum in construction generally is on the increase. Despite the opportunities provided in AFGW, personal observations show that it has not been identified and incorporated for training purposes to enhance technical college graduates' employability skills.

Employability skills refer to technical and non-technical skills required by an individual to enter and make progress and function effectively in the world of work. Employability skills according to Rowe and Zegwaard (2017) refer to work-readiness skills necessary for acquiring and retaining a job in a competitive environment. In the views of Muhammad et al. (2017), employability skills are a person's ability to actively adjust to a particular job for easy survival and realization of success at work. Skills refer to overt qualities demonstrated in technical and practical abilities to solve cogent problems that are of benefit to self and the society at large (Oke & Olakotan, 2017).

Facilities are objects and materials used for teaching effectively in TVET institutions. Oke and Olakotan (2018) asserted that facilities are the pivot on which skill acquisition hinges in all TVET institutions. Additionally, Davis (2011) stated that adequate training facilities enhance the skill development of students in technical occupations. Facilities for implementing Aluminium Fabrication and Glazing Work modules include equipment, tools, and consumables some of which are: measuring tape, bench vice, steel rule, vernier caliper, hacksaw, try-square, center punch, scriber, screwdriver, hand drill, jig saw, aluminum cutting machine, off cut machine, rivet gun, tap and dies, Aluminium Sections (All size and shape), hacksaw blades, screws, rivets, drill sets, and rubber among others. Lemo and Olakotan (2016) noted that facilities constitute a very important resource in the attainment of educational objectives and that their availability, adequacy, and utilization enhance skill acquisition. Also, Yisa and Olakotan (2017) averred that training learners with relevant facilities helps in acquire skills to carry out given tasks.

STATEMENT OF THE PROBLEM

Facilities constitute a major resource for the implementation of any meaningful program in TVET, Aluminium Fabrication inclusive. However, if relevant facilities are not identified, and procured as

appropriate, the implementation of any skill-based program will be marred and the expected skills to be possessed by recipients of such programs will be hampered. Thereby, giving room for unemployment and idleness among youths of workable age in Nigeria.

PURPOSE OF THE STUDY

The study ascertained facilities for implementing employability skills modules in aluminum fabrication and glazing work for Technical Colleges.

RESEARCH QUESTION

What are the facilities that will be appropriate for implementing employability skills modules in aluminum fabrication in Nigerian technical colleges?

METHODOLOGY

This study adopted a descriptive research design of the survey type which involved the use of a questionnaire to elicit information from the respondents. The design was considered suitable for the study since it sought the opinions of technical teachers, technologists, and industrial-based supervisors, and no variable was manipulated. The population for the study was 1181 which comprised 147 technical teachers (Mechanical biased), 116 technologists, and 918 industrial-based supervisors. The sample size for this study was 318 using a multistage sampling procedure. Stage one involved the selection of 132 respondents comprising 22 technical teachers each from Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo States using a proportionate sampling technique. Stage two involved the selection of 96 respondents comprising 16 technologists each from Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo States using a simple random sampling technique. Stage three involved the selection of 90 respondents comprising 15 industrial-based supervisors each from Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo States using a purposive sampling technique. The purposive sampling technique was adopted because this sample had the desired criteria and therefore the researcher exercises judgment on the representative sample to suit the research purpose.

A self-developed instrument entitled "Implementing Employability Skills Module Questionnaire (IESMQ) was used for the study. The IESMQ was based on an adapted Likert Scale rating of Highly Required (HR) – 5, Required (R) – 4, Undecided (U) – 3, Not Required (NR) - 2, Highly Not Required (HNR) -1. The face and content validation of the instrument was ascertained by five experts, while the reliability of the instrument was ensured using Cronbach Alpha, and a coefficient of 0.92 was obtained.

The instrument was administered to the respondents with the help of six research assistants out of the 132 copies distributed to technical teachers, 103 copies were retrieved, 79 copies were also retrieved from technologists out of 96 copies earlier distributed, while 85 copies were retrieved from industrial-based supervisors from the 90 copies earlier distributed. In all, 267 copies were duly returned representing an 83.9% return rate.

The data generated was analyzed using descriptive and inferential statistics. The descriptive statistics of mean and standard deviation were used to answer the research question raised. Furthermore, as soon as the descriptive analysis was achieved, the normality of the data for each construct was ensured before embarking on Confirmatory Factor Analysis (CFA). The CFA was done using Analysis of Moment Structures (AMOS) software.

A mean of 3.50 was used as the cut-off point for the decision rule for each item. Based on this value, any item with a mean of 3.50 and above was considered appropriate, while any item with a mean below 3.50 was considered inappropriate. Therefore, for every fitted model, all the factor loadings must be equal to or above 0.5. Also, the modification indices such as CFI, IFI, and TLI must be above 0.90; the ratio of the Chi-square and the Degree of freedom (df) < 3 and RMSEA < 0.08. Hence, the revised models were performed wherever the initial CFA models did not meet up with the stated criteria.

FINDINGS AND DISCUSSION

Research Question

What are the facilities that will be appropriate for implementing employability skills modules in aluminum fabrication in Nigerian technical colleges?

To answer the research question, mean and Confirmatory Factor Analyses were used. The result of the computation is presented in Table 1 as well as Figures 1 and 2.

Table 1. Appropriate facilities for implementing employability skills module in aluminum fabrication and glazing work

S/N	Appropriate Facilities for Implementing Employability Skills Modules in AFGW are:	$\bar{X}$	S.D	Remarks
1	Basic hand tools	4.36	.91	Required
2	Basic power tools	4.40	.84	Required
3	Basic equipment	4.37	.89	Required
4	Personal protective equipment	4.27	.97	Required
5	Miscellaneous tools	4.29	.95	Required
6	Advanced machines	4.36	.86	Required
7	Basic machines	4.27	.97	Required
8	Consumables and accessories	4.32	.93	Required
9	Teaching and learning facilities	4.42	.92	Required

The data presented in Table 1 revealed 9 appropriate facilities for implementing the Employability Skills Module in Aluminium Fabrication and Glazing Work. The Mean for the facilities ranged from 3.87 to 4.97. Each Mean is above the cut-off of 3.50 showing that all were required for implementing the Employability Skills Module in Aluminium Fabrication and Glazing Work. The standard deviation of the facilities also ranged from .84 to .97. This indicated that the respondents were close to one another in their opinions and that they were not far from the mean.

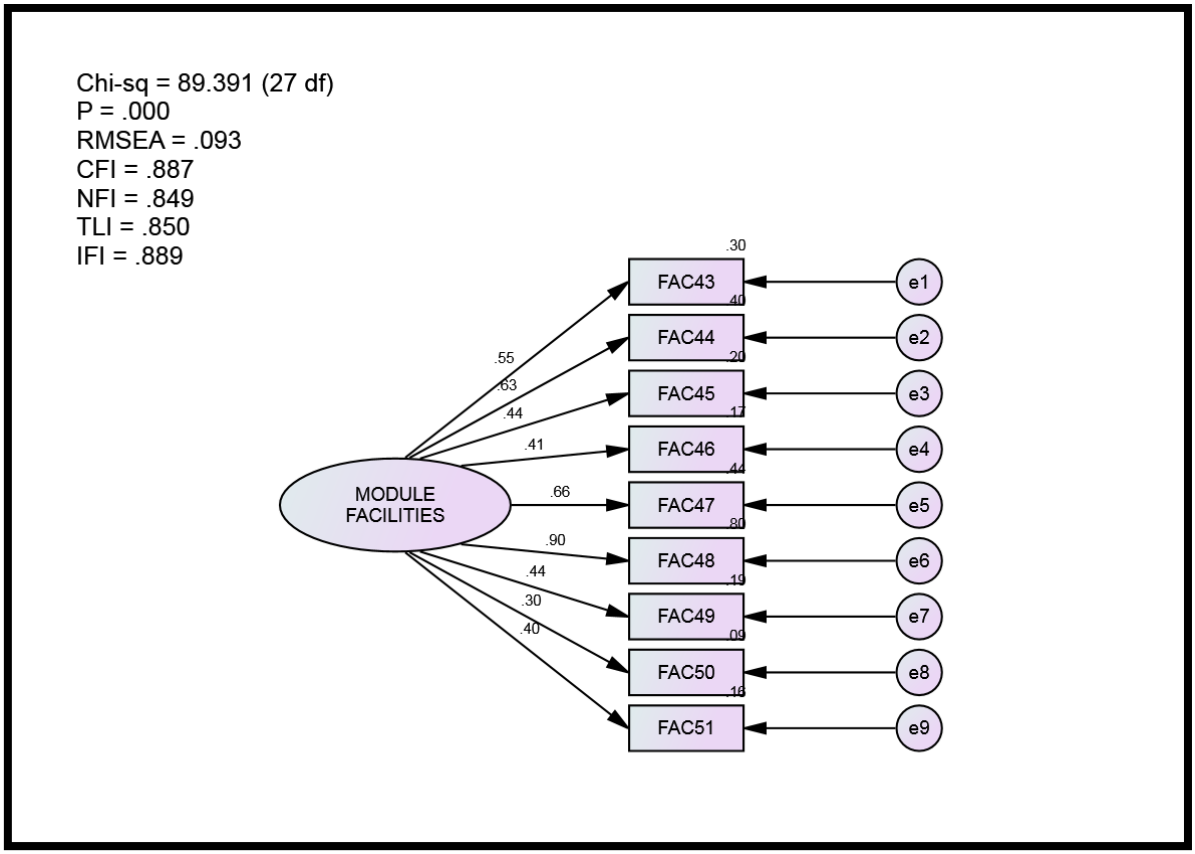

Figure 1. The initial model for appropriate facilities for implementing employability skills module in aluminum fabrication and glazing work

The initial model based on Confirmatory Factor Analysis (CFA) on appropriate Facilities for Implementing Employability Skills Module in Aluminium Fabrication and Glazing Work was not found fitted and did not comply with a goodness model fit. The Chi-square = 89.391, df = 27, P = .000, the ratio of the Chi-square and the df (> 3) = 3.31, NFI = .849 (< .90), CFI = .887 (< .90), IFI = .889 (< .90), TLI = .850 (< .90) and RMSEA = .093 (> .080). Hence, to fulfill the requirements, the model was trimmed sequentially so that the items remaining would fit well to the data at P > 0.05 while the modification indices (NFI, CFI, IFI, TLI) and RMSEA measured up to the standard.

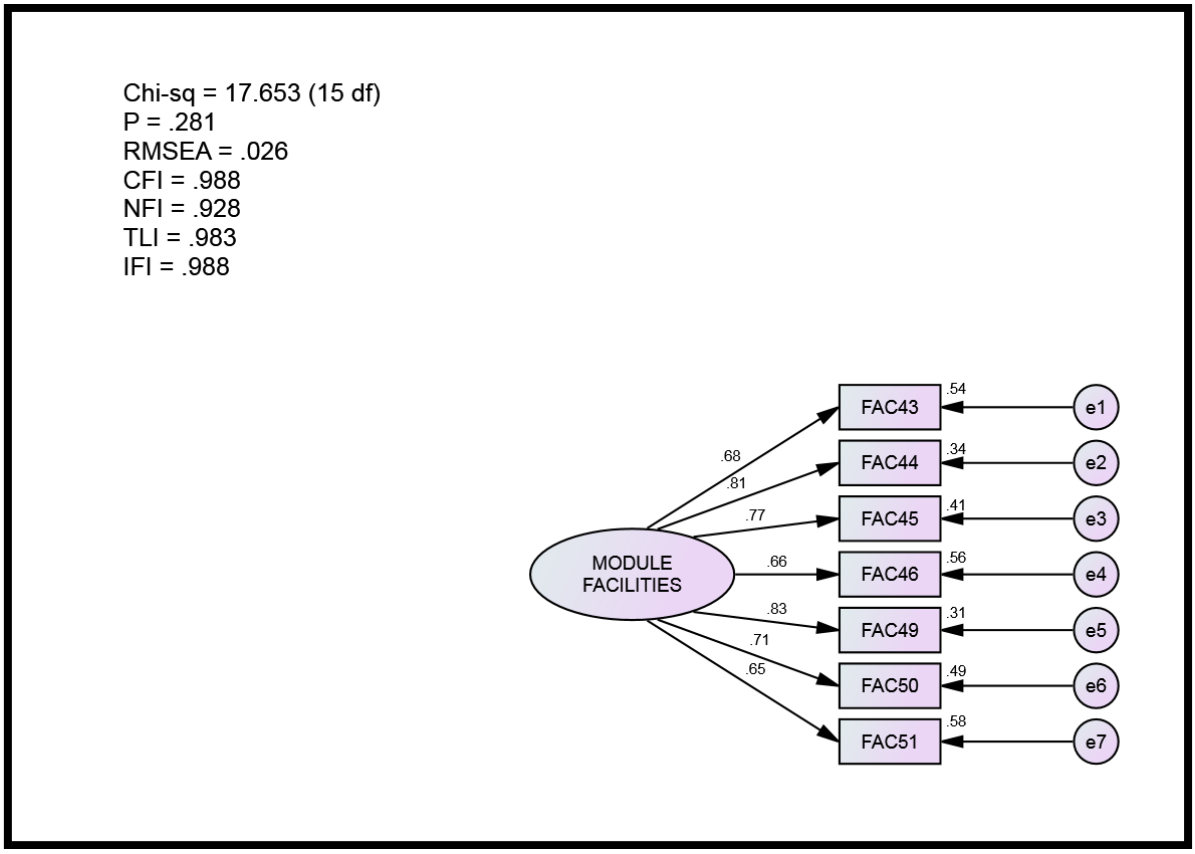

Figure 2. Revised model on appropriate facilities for implementing the employability skills module in aluminum fabrication and glazing work

The revised model developed on appropriate Facilities for Implementing the Employability Skills Module in Aluminium Fabrication and Glazing Work had seven items with factor loadings ranging from .65 to .83. The Chi-square = 17.653, df = 15, P = .281, the ratio of the Chi-square and the df (< 3) = 1.17, NFI = .928 (> .90), CFI = .988 (> .90), IFI = .988 (> .90), TLI = .983 (> .90) and RMSEA = .026 (< .080).

Table 2. Factor loadings for appropriate facilities for implementing employability skills module in aluminum fabrication and glazing work

CODE	Item Statements	Initial Model		Revised Model		Validity/ Reliability	
		Factor Loading	Error Variance	Factor Loading	Error Variance	CR	AVE
	Facilities						
FAC 1	Basic hand tools	.55	.30	.68	.53		
FAC 2	Basic power tools	.63	.40	.81	.34		
FAC 3	Basic equipment	.44	.20	.77	.41	**0.89**	**0.54**
FAC 4	Personal protective equipment	.41	.17	.66	.56		
FAC 5	Miscellaneous tools	.66	.44	Deleted			
FAC 6	Advanced machines	.90	.80	Deleted			
FAC 7	Basic machines	.44	.19	.83	.31		
FAC 8	Consumables and accessories	.30	.09	.71	.49		
FAC 9	Teaching and learning facilities	.40	.16	.65	.58		

The initial factor loadings of the appropriate facilities for implementing the Employability Skills Module in Aluminium Fabrication and Glazing Work had initial factor loadings of 9 items ranging from .30 to .66. While the revised factor loadings had six items with factor loadings ranging from .65 to .83. Each factor loading is above the cut-off of 0.5 showing that all were required for the implementing Employability Skills Module in Aluminium Fabrication and Glazing Work. The Composite Reliability (CR) of the appropriate facilities for implementing the Employability Skills Module in Aluminium Fabrication and Glazing Work is 0.89, while the Average Variance Extracted (AVE) is 0.54.

Discussion

The findings of the study on appropriate facilities revealed that seven facilities are adjudged necessary for implementing the Employability Skills Module in Aluminium Fabrication and Glazing Work. The findings on the facilities for implementing the Employability Skills Module in Aluminium Fabrication and Glazing Work are in agreement with the submissions of Davis (2011) who stated that adequate training facilities enhance the skill development of students in technical occupations. Similarly, the submissions of Lemo and Olakotan (2016) also buttressed the findings of this study as the duo noted that using facilities during teaching and learning would equip the students with adequate psychomotor skills and as a result improve their interest level, stimulate their interest to participate in the teaching and learning activities, help them to picture reality in what has been taught and create an interactive learning environment thereby promoting effective teaching and learning.

Similarly, the positions of Yisa and Olakotan (2017) regarding the findings of this study was that training learners with relevant facilities helps in acquiring skills to carry out given tasks. Therefore, the adjudged necessary facilities for implementing the Employability Skills Module in Aluminium Fabrication and Glazing Work include basic hand tools; basic power tools; basic equipment; personal protective equipment; basic machines; consumables and accessories, and teaching and learning facilities.

CONCLUSION

The need to identify appropriate facilities for implementing an employability skills module in

aluminum fabrication necessitated this study. This is to ensure that implementers of employability skills modules in aluminum fabrication procure and utilize appropriate facilities for effective skill acquisition in aluminum fabrication. Therefore, there is a need for relevant stakeholders to ensure that the identified facilities are given priority and procured for the successful implementation of the employability skills module in aluminum fabrication.

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