Shodh Sari-An International Multidisciplinary Journal


2023, Vol. 02, Issue 04, 15-27
ISSN: 2959-1376
DOI: https://doi.org/10.59231/SARI7621

# Quantitative validation of entrepreneurial opportunity competency model: AMOS-SEM approach

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## ABSTRACT

Entrepreneurial opportunity competencies have been recognized as the initial stage of entrepreneurship and is seen as a critical competency needed by technical college students in their training as technicians that will lead them to improve their innovativeness and willingness to start their own enterprises after graduation. The objective of the study is to determine the important elements of entrepreneurial opportunity competencies required by technical college students for self-employment in Nigeria. Descriptive survey research design has been used for the collection of the data, which includes using a questionnaire to determine the respondents' opinions and views. A structure questionnaire titled "Important elements of Entrepreneurial Opportunity Competencies required by Technical College Students for self-employment Questionnaire (IEOCTCSQ)" with 11 items was designed to collect data. The target population constitute 650 teachers and 241 entrepreneurs. The reliability of the instrument was determined through Cronbach's alpha and the value obtained was .828. Accordingly, the data analysis was performed using AMOS version 23.0. The study established 8 important elements of entrepreneurial opportunity competencies in the model worthy for inclusion in the programs of technical colleges of Nigeria. It is recommended that the implementation of this EOC model by technical colleges should be closely monitored by

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ISSN: 2959-1376 DOI: https://doi.org/10.59231/SARI7621

college administrators. The impact of this model may include graduating students with entrepreneurial opportunity competencies who will become self-employed by starting up their own venture.

**KEY WORDS:** *Technical colleges, opportunity entrepreneurial competencies, self-employment.*

## INTRODUCTION

Entrepreneurial opportunity competency is the ability to be familiar with opportunity, to seizure opportunity, and to recognize customers' need (Kaur and Bains, 2013). Opportunity identification is the starting point of entrepreneurial process. Hence, to recognize the initial stage of entrepreneurship and is seen as a critical competency which students need during their training that will lead to the improvement of their innovativeness, proactiveness, and willingness to take risks propensity that the development of venture ideas encompasses (Lindberg, Bohman, Hulten and Wilson, 2017).

Since there is an existing problem in the curriculum of the technical colleges in Nigeria (Muhammad, Kamin and Husna, 2020) due to the absence of entrepreneurial competencies (ECs) (Muhammad et al., 2019) that is why most of the students are graduating without the required entrepreneurship skills needed for the establishment of small and medium enterprises (SMEs) as opined by Dawha and Medugu (2016). Therefore, study is intended to create opportunities to change the way in which students perceive reality and interpret information to allow them to be more effectively identify new business opportunities. Since entrepreneurial opportunity development can be improved, Sołoducho-Pelc (2015) opined that opportunities are dynamically developing and changing together with the changes that occur, so in approaching the opportunities an active attitude is required. Therefore, it is imperative to help students to develop attitudes that lead them to identify markets opportunities. Consequently, Sołoducho-Pelc (2015) argued that the development of entrepreneurial opportunity is dynamic and goes along with the current situations, as a result the approach to entrepreneurial opportunity has to focus on attitude of the learner. In fact, Brown and Hanlon (2016)

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enumerated three important point for opportunity identification:

(a) Conduct a good market exploration before starting the business.
(b) Identify an appropriate market place which would withstand the business.
(c) Develop goods/services that can sustain the market competition requirement.

Therefore, there is an urgent need to integrate EOC into the curricular of the technical colleges (Muhammad, Kamin and Husna, 2019) entrepreneurial opportunity could be achieved through developing an entrepreneurial model for the technical colleges.

**Research Objective**

To determine the important elements of entrepreneurial opportunity competencies required by technical college students for self-employment in Nigeria.

**Research Question**

What are the important elements of entrepreneurial opportunity competencies required by technical college students for self-employment in Nigeria?

## METHODOLOGY

Survey research design was used by the researchers in this study (Creswell, 2009). This type of research design is used in quantitative approach as a data collection method in a study (Gall, Gall and Borg, 2007; Johnson and Christensen, 2012; Creswell, 2014).

The location of the study was north-west geo-political zone; it constitutes 7 out of the 36 states in Nigeria. Hence, specifically, the research was conducted at technical colleges and SMEs in the three states (Jigawa, Kano and Kaduna) of the north-west geo-political zone. All the technical colleges in the zone are established and financed by either the federal or state government. Additionally, all the Federal and State own technical colleges are supervised by National Board for Technical Education (NBTE) in terms of curriculum, staffing and supervision (Muhammad, Kamin, Husna and Hamza, 2020).

The sampling procedure used was cluster sampling; three out of the seven states listed in the study area were used. Kumar (2011) opined that cluster sampling is generally achieved when the population is vast, such as

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country, state, city or town; hence, the sample population is distributed into collections known as cluster.

The procedure of the sampling in this study was according to Krejcie and Morgan (1970) table. Therefore, the target population was 891paticipants instituting 650 teachers and 241 entrepreneurs. Consequently, 254 teachers and 110 entrepreneurs were selected constituting of 364 respondents (Creswell, 2009, 2014).

A structure questionnaire titled "Important elements of Entrepreneurial Opportunity Competencies required by Technical College Students for self-employment Questionnaire (IEOCTCSQ)" with 11 items was designed to collect data. Accordingly, the data analysis was performed using the SPSS version 23.0 and AMOS.

**RESULT**

The results of this study were revealed through the reliability analyses for the measurement scales; the development and validity testing of the proposed conceptual model.

Reliability Analyses for the Measurement Scales

Table 1 shows the Cronbach's alpha scores of the instruments. All the 11 items were measured and are included in this analysis. As for reliability analysis, the Cronbach's alpha values of all the variables are above 0.7. According to Hair et al. (2014) any measurement instrument should have a reliability value more than 0.60. Therefore, the reliability of all instruments exceeded the minimum standard levels, and was accepted.

Development and Validity Testing of the Proposed Conceptual Model

To develop and test the proposed conceptual model, SEM was used through the application of Confirmatory Factor Analysis (CFA). In line with this, testing the research proposed model was based on the testing of measurement model (individual), second-order measurement model, overall model, and structural model testing. In this sense, the test of the measurement model includes the first-order CFA measurement model for the 3 latent constructs (generated from the EFA process); the second order CFA measurement model of the latent construct of entrepreneurial opportunity competencies required by technical college students for self-employment in Nigeria (Table 1). On the

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other hand, the structural model tested the overall measurement model.

**Table 1:** Latent Constructs

| **Second-order Latent Construct** | **First-order Latent Constructs** |
|---|---|
| Entrepreneurial Opportunity Competencies (EOC) | EOCP1, EOCP2 & EOCP3 |

Confirmatory Factor Analysis of Entrepreneurial Opportunity Competencies

Analysis of Moment Structures (AMOS), Version 23.0 was used to perform a CFA on the remaining 201 respondents from the overall sample of 331 to determine if the factor structure need adjustment. In this section of the analysis, as mentioned above, AMOS was used to achieve research objective, provided an answer to the research objective and tested the hypothesis. Both the research objective and the hypothesis were intended to determine the important elements of entrepreneurial opportunity competencies required by technical college students for self-employment in Nigeria.

The research question as well as its corresponding hypothesis were answered and tested using AMOS software version 23. Therefore, to determine the relationship between the responses of teachers and that of entrepreneurs on the important elements of entrepreneurial opportunity competencies required by technical college students for self-employment in Nigeria has been considered and data collected was further analyzed using AMOS analysis. AMOS being the most powerful and user-friendly SEM software enables researchers to support their research and theories by extending standard multivariate analysis methods, factor analysis, regression, correlation, as well as analysis of variance (Arbuckle and Wothke, 1999).

It is, therefore, significant to employ AMOS using the identified important elements based on their level of appropriateness and retained; and to eliminate those elements that do not contribute to the model fitness. Specifically, AMOS was specially used in this research to indicate structurally, the linear relationship between the teachers' responses and the entrepreneurs on the important elements of

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entrepreneurial opportunity competencies considered suitable for the technical college students in Nigeria. AMOS model fitness parameters were used to determine the inclusion or otherwise of an element as it relates to the sample responses based on the hypothesized model which states that 'there is a significant relationship between teachers' responses and that of entrepreneurs' on the important elements considered appropriate for technical college students.

Results of Using AMOS

Internal consistency of the important elements considered appropriate for the entrepreneurial opportunity competencies was determined using Cronbach's alpha statistics. The results obtained were presented in Table 2. These results showed that all the items under the important elements of entrepreneurial opportunity competencies were found to be reliable. In that, no value was below 0.50 (unreliable) and also all the variables are above adequate of 0.60 which is classified as conventional (Hair et al., 2014).

**Table 2:** Instrument reliability of the measurement scale

| **Construct** | **No. of items** | **Cronbach's Alpha value** |
|---|---|---|
| Entrepreneurial Opportunity Competencies | 11 | .828 |

After the internal consistencies between the elements were obtained, the initial model was tested using the 3 combinations of fit measures: Absolute fit measures, Incremental Fit measures and a parsimonious fit measure of all the models. The CFA was conducted by Amos 23, the model fit indices on measurement model (initial model) for entrepreneurial opportunity competencies (EOC) of technical college programs: based on the results obtained, the measurement model does not satisfy the goodness of fit indices; with 4.412 for $(x^2)$/DF (normed CMIN), GFI (0.936), TLI (0.875), CFI (0.917), AGFI (0.880), RMSEA (0.102) and P<0.005. This has resulted in the modification of the initial model by eliminating and anchoring variables that contribute less to the model goodness of fit.

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Figure 1 below presents the structure of the measurement model.

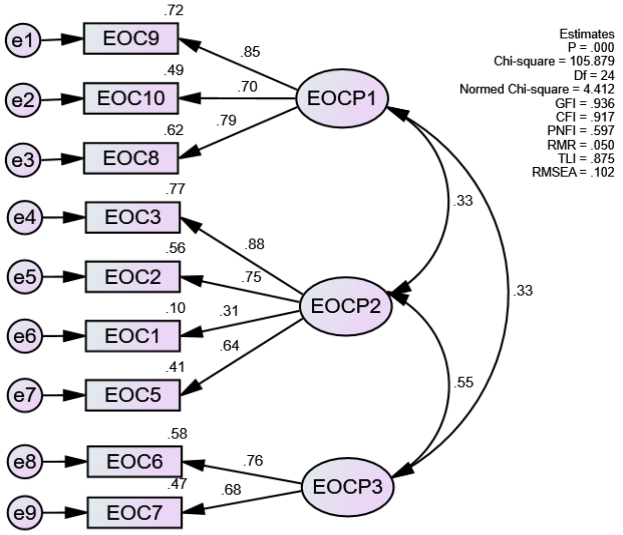


**Figure 1**: Measurement Model of Entrepreneurial Opportunity Competencies

Figure 1 displays a total of 9 important elements of Entrepreneurial Opportunity Competencies: EOC9 (Due diligence evaluation for a new business plan); EOC10 (Ability to evaluate business at each developmental stage.); EOC8 (Identify new technologies and ventures that targeted existing markets with new technologies); EOC3 (Ability to development as a continuous, proactive process essential to the formation of a business.); EOC2 (Ability to form business that can create and deliver value.); EOC1 (Innovate products by simultaneously innovating social acceptance for those products in the market place.); EO6 (Discovering a ‘‘fit’’ between particular market needs and specified resources) and EO7 (Creating a new ‘‘fit’’ between separate needs and resources in the form of a business concept) that were measured to determine the relationship between the teachers and entrepreneurs in their responses on the important elements of opportunity entrepreneurial competencies required by technical college students for self-employment. The model revealed that e7 (EOC5) had low factor loading (Figure 1) with the important elements of opportunity entrepreneurial competencies: which contributed to the unfit of the model. Hence, the item was removed. Consequently, to further run the model analysis, covariance was put into another two items: e4 (EOC3) and e5 (EOC2) in CFA.

After the third run of the CFA through Amos 23, the validity inspection of measurement model of Entrepreneurial Opportunity Competencies indicated that the level of model fit was satisfied as the results of the standardized estimates (Figure 2) showed that the value of CMIN was 50.216 with 18 DF and the p-value related with the result was significant at p=0.000. Accordingly, the

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normed chi-square (2.790) was accepted (between 1 and 3) and a good value of normal (less than 3) was sufficient to show a good model fit (Hair et al., 2014). The GFI (0.962) and AGFI (0.925) were both greater than 0.9; the TLI (0.938) was also greater than 0.9; the RMSEA was 0.074; a measure of less than 0.08 for RMSEA established the goodness-of-fit analysis. These results suggest that the modified model of entrepreneurial opportunity competencies revealed a satisfactorily good fit. Consequently, the hypothesis on the significant relationship between the teachers' and entrepreneurs' responses related to entrepreneurial opportunity competencies was hereby upheld and Figure 2 was generated.

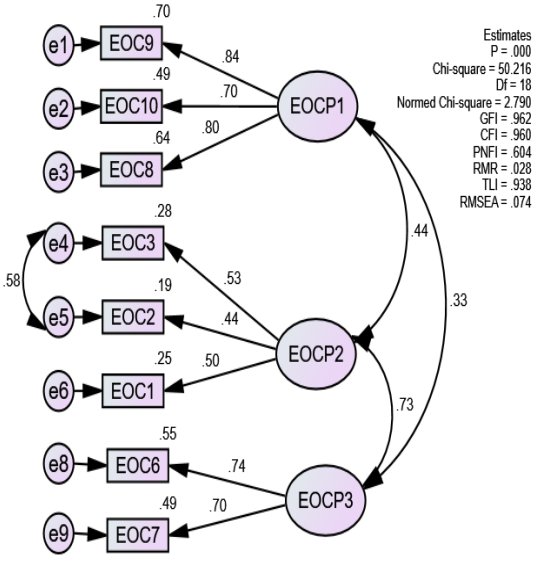


**Figure 2**: Modified Model of Entrepreneurial Opportunity Competencies

Figure 2, shows a modified model of the significant relationship between the teachers' and the entrepreneurs' responses on the 8 items of entrepreneurial opportunity competencies considered as important by technical college students for self-employment in Nigeria. Therefore, from the modified model (Fig. 2) it can be established that in order to properly integrate entrepreneurial competencies into technical college programs, these essential elements of opportunity entrepreneurial competencies should be taken into account.

Validity and Reliability of Entrepreneurial Opportunity

Consequently, the output estimate tables of EOC in CFA via Amos 23 (Table 3) presented that the values of all factor loadings were acceptable (overall items were higher than 0.6). Additionally, the average variance extracted (AVE) of EOC was 0.50 and the composite reliability (CR) of EOC was 0.65. These results shown that the entire values of AVE were higher than 0.5 and values of CR were higher than 0.6. Therefore, these results

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ISSN: 2959-1376 DOI: https://doi.org/10.59231/SARI7621

revealed that EOC had adequate convergent validity as suggested by (Awang, 2016).

## FINDINGS OF THE STUDY

Factor 1(EOCP1) contains three items which were EO9 (Due diligence evaluation for a new business plan), EO10 (Ability to evaluate business at each developmental stage.) and EO8 (Identify new technologies and ventures that targeted existing markets with new technologies). Factor 2 (EOCP2) contains four items which were EO3 (Ability to development as a continuous, proactive process essential to the formation of a business.), EO2 (Ability to form business that can create and deliver value.) and EO1 (Innovate products by simultaneously innovating social acceptance for those products in the market place.). Factor 3 (EOCP3) contains two items which were EO6 (Discovering a ‘‘fit’’ between particular market needs and specified resources) and EO7 (Creating a new ‘‘fit’’ between separate needs and resources in the form of a business concept).

## DISCUSSION

The result of this study on entrepreneurial opportunity competencies (EOC) model shown that eight important competencies are accepted by the respondents for integration into technical college programs curriculum. Therefore, these competencies are discussed as follows: Due diligence evaluation for a new business plan; Ability to evaluate business at each developmental stage; Identify new technologies and ventures that targeted existing markets with new technologies; The results are supported by work of Morris et al., 2013) who emphases the importance of these competencies for early growth of a business venture.

Ability to development as a continuous, proactive process essential to the formation of a business. This is an essential competency needed for an entrepreneur to prosper (Rezaeizadeh et al., 2017). Ability to form business that can create and deliver value; Innovate products by simultaneously innovating social acceptance for those products in the market place; Discovering a ‘‘fit’’ between particular market needs and specified resources; and creating a new ‘‘fit’’ between separate needs and resources in the form of a business concept. The findings are concurred with that of Ardichvili et al., (2003) who proposed that opportunities start as easy ideas that become more innovative as

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ISSN: 2959-1376
2023, Vol. 02, Issue 04, 15-27
DOI: https://doi.org/10.59231/SARI7621

the entrepreneurs develop them. Likewise, the findings are in line with the assertion of Sołoducho-Pelc, (2015) maintained that development of entrepreneurial opportunity is self-motivated and goes along with the existing circumstances.

Therefore, these identified competencies of EOC are among the findings of this study that used to produce the conceptual model as shown in figure 3 which if adopted by the Nigerian government through NBTE it would accomplish the government enthusiasm towards the realization of sustainable entrepreneurship for self-reliance and economic growth of the nation.

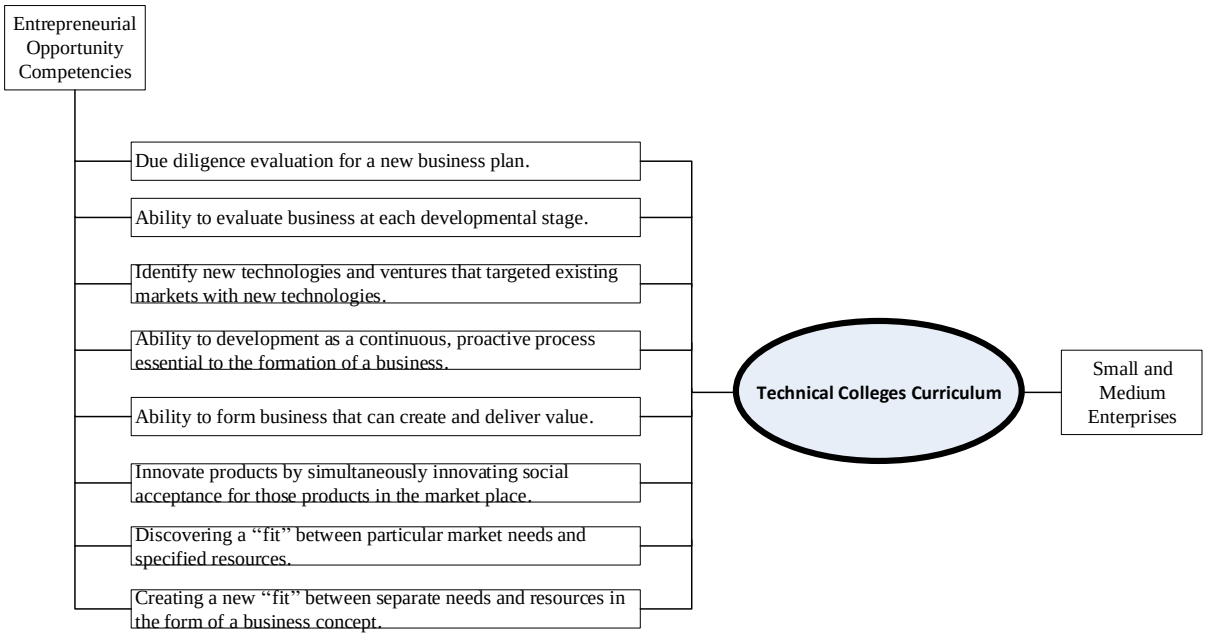


**Figure 3**: Entrepreneurial opportunity competencies conceptual model

## CONCLUSION

The underlying principle of this study was to develop and validate an EOC conceptual model for students of technical colleges for the achievement of sustainable entrepreneurship in Nigeria. The prevailing gaps in ECs required by students at Nigeria technical colleges were achieved by the outcome of this study. Furthermore, understanding of the significance of this study depends largely on its contribution and implementation on theory and practice respectively. In essence, this research has practical implications for the Federal and State Government of Nigeria, policy makers,

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ISSN: 2959-1376
2023, Vol. 02, Issue 04, 15-27
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curriculum developers, administrators, lecturers, students, and the entire Nigeria community.

Building on the above, the contribution of this study is based on an extensive and critical review of the current and previous literature on entrepreneurship in which a research gap was highlighted thereby creating the need for developing the conceptual model of the research. In this study, new research perspective was proposed and important elements of EOC were also confirmed.

## RECOMMENDATIONS

(a) It is imperative that federal and state governments through NBTE who are the policy makers to plan, organize, and implement the model in the curriculum of technical college programs in Nigeria.

(b) The implementation of this EOC model by technical colleges should be closely monitored by college administrators. The impact of this model may include graduating students with entrepreneurial opportunity competencies who will become self-employed by starting up their own venture.

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ISSN: 2959-1376
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ISSN: 2959-1376
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Received on March 22, 2023

Accepted on Aug 25, 2023

Published on Oct 01, 2023