FACTORIAL VALIDATION OF ENTREPRENEURSHIP MINDSET SCALE OF SCIENCE EDUCATION UNDERGRADUATE STUDENTS

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Abstract
Considering the place of entrepreneurship in the future of undergraduate students in Nigerian University, the study sought to determine the psychometric properties of entrepreneurship mindset scale of Science Education undergraduate students. This study adopted instrumentation research design with a population of 214 final year undergraduate students of Science Education Department, Faculty of Education, University of Nigeria, Nsukka for 2018/2019 academic session. A sample of 144 students was obtained through accidental sampling technique. A 37-item instrument titled "Entrepreneurship Mindset Scale (EMS)"developed by the Kern Entrepreneurial Engineering Network (KEEN) framework was adapted and face validated. The construct validation of the EMS was done using exploratory factor analysis while the internal consistency and stability reliability indices of the instrument were estimated using Cronbach Alpha method and Pearson product moment correlation respectively. The study found that the items of the EMS correlated positively with each other. This by implication shows that the items of EMS are related with one another and thus address a particular construct. However, out of the 37 items of the EMS, 26 were found to be factorially pure. The Kaiser-Meyer-Olkin (KMO) Test measure of 0.608 showed that the sample for the factor analysis of the EMS was very adequate. Bartlett's test of sphericity is significant meaning that its associated probability (0.000) was less than 0.05, and was small enough to reject the null hypothesis. The internal consistency and stability reliability indices of the EMS were found to be 0.769 and 0.843 respectively. Both state and federal governments should make provisions for graduates of higher institutions to harness their entrepreneurial skills after graduation since they have shown positive mindset toward entrepreneurship.

Keywords: Factorial validation, Entrepreneurship Mindset Scale, Science Education

Introduction

The main reason for acquiring tertiary education is to prepare individuals not only by providing them with adequate and relevant job skills, but also by preparing them to be active members of their communities and societies. Despite being equipped with tertiary education, government has urged tertiary graduates to practice entrepreneurship (create business or jobs), rather than only seeking for jobs.

Entrepreneurship is the process of designing, launching and running a new business, which is often initially a small business. Entrepreneurship has been described as the "capacity and willingness to develop, organize and manage a business venture along with any of its risks in order to make a profit. Ogbackirigwe (2010) defined entrepreneurship as the power, authority and consent given to someone to carry out certain activities in business on his or her own without someone intervening in decision making. Entrepreneurship according to Drucker in Akuma and Igu (2012) is all about taking risk. It typically focuses on the launching and running of businesses, due to the high risks involved in launching a start-up, a significant proportion of start-up businesses have to close due to "lack of funding, bad business decisions, an economic crisis, lack of market demand, or a combination of all of these. Omiko (2012) is on a view that entrepreneurship is a practice of starting new organizations (business) or revitalizing an old organization. Ogbackirigwe (2010) defined entrepreneurship as the power, authority and consent given to someone to carry out certain business activities on his/her own without someone intervening in the decision. The people who create these businesses are called entrepreneurs. According to Omiko (2012), entrepreneur is an entity which has the ability to find and act upon opportunities to translate inventions or technologies into products and services: "The entrepreneur is able to recognize the commercial potential of the invention and organize the capital, talent, and other resources that turn an invention into a commercially viable innovation. In this sense, the term "Entrepreneurship" also captures innovative activities on the part of established firms, in addition to similar activities on the part of new businesses.

Presently in Nigeria, university graduates appear to lack entrepreneurship knowledge and skills, and thereby faced with the problems of graduate unemployment, poverty, crime, and other social vices (terrorism, kidnappings, prostitution etc) which are as a result of economic meltdown or unsustainable development in the country, which needs urgent attention. A number of scholars are of the opinion that entrepreneurship education is the solution for curbing a country's problems, such as the ones Nigeria is facing today, especially among the graduates (Olorumolu & Agbede, 2012; Efe, 2014; Okon& Friday, 2015). In order to overcome these problems, the federal government of Nigeria through Nigerian Higher Education Institutions (HEIs) and National Universities Commission (NUC) directed the tertiary institutions to include Entrepreneurship Education (EE) as a compulsory Course (Centre for Entrepreneurship, Development and Research –("CEDR") for all tertiary students across the country with effect from the 2007/2008 academic session, which is aimed at equipping these students with entrepreneurial skills, attitudes and competencies in order to be job creators and not just job hunters. Except the university undergraduates are exposed to the right education, such as entrepreneurship education, these problems will continue to exist.

Entrepreneurship education is a causal agent for economic development and job creation in any society. A broader definition of entrepreneurship education that concern university undergraduate is that of Enu (2012), which stated that entrepreneurship education is a form of education that seeks to provide knowledge, skills, attitude and motivation to students for entrepreneurial success in any facet of human endeavours. Enu (2012) further argues that entrepreneurship education equips students with the ability to seek investment opportunities and maximize returns from those investments after graduation rather than roaming the streets in-search for white collar jobs. In Nigeria, the white collar job opportunities are limited and very competitive. It cannot go round to all graduates job seekers in Nigeria because of the high number of graduates being produced every year from higher institutions (universities, college of educations and polytechnics). Obinna (2014) stated that entrepreneurship education is the process through which individuals acquire a broad set of competencies that can produce greater social and economic benefits to the individuals. Entrepreneurship education is the process of professional application of knowledge, attitude, skills and competences that involve creativity, innovation and risk taking(Gautam & Singh, 2015).

In most developed economies, the entrepreneur is the main force behind high productive activities, which the knowledge and skills needed are gotten from a sound and effective entrepreneurship education. Entrepreneurship education's focus is to provide the students with requisite skills and capacities needed in the world of work. Contextually, entrepreneurship education (EE) is the kind of education that seeks to provide university undergraduate students with the knowledge, skills and mindset which creates a pathway to transform creative ideas into entrepreneurial action. The introduction of Entrepreneurship Education (EE) into university curriculum is important for university students to gain entrepreneurship experience before graduating as many employers are seeking for graduates with entrepreneurial mindset and such graduates can as well be entrepreneurs. This is essential because students who have an entrepreneurial mindset are accountable for their own actions, bring new perspectives and youthful ideas into the workplace. However, very few comprehensive, generalized and well-validated instruments are available for assessment purpose. Most scholars focused on the design, challenges and implementation of entrepreneurship education without considering the entrepreneurship mindset of the students who are going to study this entrepreneurship education. Entrepreneurship mindset according to McGrath and MacMillian (2000) is the ability to rapidly sense, act and mobilize, even under certain conditions. Entrepreneurship mindset is a set of cross-functional life and professional skills that describe someone who is innovative, resourceful and creates values. The Network for Teaching Entrepreneurship (2015) defined the entrepreneurial mindset as the set of attitudes, skills and behaviors that students need to succeed academically, personally and professionally. These include: initiative and self-

direction, risk-taking, flexibility and adaptability, creativity and innovation, critical thinking and problem solving. Other definitions include the ability to see opportunities, marshal resources and create value.

Contextually, entrepreneurs have different entrepreneurship mindset that contributes to their success. Their entrepreneur mindset might have to do with their personality or even the field in which they have chosen to work. The Network for Teaching Entrepreneurship (2015) selected the experiences and entrepreneur mindset of 10 well-known entrepreneurs from a variety of different fields, which this study anchored on to develop entrepreneurship mindset scale. The entrepreneurship mindset of 10 successful entrepreneur are: reach out to customers first, find a new market for an existing product, use networking to build your business, give without expecting a return, keep control of your vision, understand the power of branding, focus your energy on what is good for your business, always maintain quality control, set your product apart, and take ownership. Ferrro and Fioro (2014) were of the opinion that entrepreneurship mindset is "being entrepreneur is a state of mind". It is about analysing the world and what is happening in terms of opportunities and possibilities, trying to understand how an individual intervention can enter the economic and social system in terms of construction and progress, then it's about putting into practice objectives and translating ideas into actions.

Define an entrepreneurial mindset as "the ability to conditio

Few studies have been on development of instrument on entrepreneurial mindset of students. In a study of Li, Harichandran, Carnasciali, Erdil and Nocito-Gobel (2016) on development of an instrument to measure the entrepreneurial mindset of engineering students, Kern Entrepreneurial Engineering Network (KEEN) assessment instrument consisting of 37 items was adopted. An exploratory factor analysis of this pilot instrument resulted in a 29-item solution. Additional reliability analysis based on Cronbach's alpha suggested further reduction of items with low internal consistency. Finally, a preliminary instrument with 27 items loaded on 9 factors measuring the entrepreneurial mindset was established. Maduako (2017) in a study on development and validation of entrepreneurship mindset scale of secondary school students indicated that the 30-item entrepreneurial mindset scale developed by the researcher was factorially reduced to 22-item using senior secondary school three (SSS3 students) in Anambra Central Senatorial zone of Anambra State. Zaidatol,Lope, and Keetanjaly (2016) in a study on predictors of entrepreneurial mindset among university students found out that university students have moderate level of entrepreneurial mindset and discovered that the level of self-entrepreneurial competencies was overall moderate level. Since entrepreneurship education is for all university undergraduate students, introducing entrepreneurship education to this set of students is a new trend. Hence, the researchers validated an adapted version of entrepreneurship mindset scale (EMS) of KEEN by The Network for Teaching

Entrepreneurship (2015) using Science Education undergraduate Students in University of Nigeria Nsukka (UNN).

Thus, the current study presented the psychometric properties of EMS using Nigerian University Undergraduates. Specifically, the following properties of the EMS were estimated using exploratory factor analysis: (i) Kaiser-Mayer-Olkin (KMO) and Bartlett's test of the items of EMS, (ii) communality indices of the items of EMS; (iii) total variance of each of the items of EMS; (iv) component matrix of the EMS; (v) internal consistency reliability index of the EMS; and (vi) norm of EMS based on area of specialization.

Method

This study adopted instrumentation research design. The population of the study comprised all the 214 final year undergraduate students of Science Education Department, Faculty of Education, University of Nigeria, Nsukka for 2018/2019 academic session. A sample of 144 students was used for the study. The sample was obtained using accidental sampling technique. The choice of the sampling technique was because these werethe students who were present at the lecture class as at the time the instrument was administered. The choice of the students was because the students have offered entrepreneurship education as a compulsory general course in their 300 level. The Entrepreneurship Mindset Scale (EMS) instrument from the framework of Kern Entrepreneurial Engineering Network (KEEN)with a6-point rating scale of "I DON'T UNDERSTAND" (6 points), STRONGLY DISAGREE (1 point), DISAGREE (2 points), NEUTRAL (3 points), AGREE (4 points) and STRONGLY AGREE (5 points)was adapted and used for data collection. The original version of the EMS was meant for Engineering students. Thus, the items were modified to suite the science education undergraduate students for this study. Section A of the instrument covered the demographic data of the students while section B contained 37 items showing the entrepreneurship mindset of science education undergraduate students as adapted. From the KEEN's framework, the responses were modified to 4-points rating scale of STRONGLY AGREE (4 points), AGREE (3 points), DISAGREE (2 points) and STRONGLY DISAGREE (1 point). The instrument was revalidated by three experts in the Department of Science Education, University of Nigeria Nsukka, to ascertain the face validity. Construct validation was also established. The real limit of numbers was used to take decision on extent of entrepreneurial mindset of students as follows: using VERY LOW EXTENT as (1-1.49), LOW EXTENT (1.5-2.49), HIGH (2.5-3.49), and VERY HIGH EXTENT (3.5-4.00).

Construct Validation

The instrument was construct validated by subjecting it to exploratory factor analysis using principal component matrix. This was done after the completion of the

questionnaire items by the chronic pain patients. After that, the data collected were coded and factorially analysed.

Kaiser-Meyer-Olkin (KMO) and Bartlett's Test

Table 1: KMO and Bartlett's Test for the Adequacy of the sample for the factor analysis of EMS

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.608
Bartlett's Test of Sphericity	Approx. Chi-Square	4987.872
	Df	666
	Sig.	.000

The **KMO** measures the sampling adequacy which should be greater than 0.5 for a satisfactory factor analysis to proceed. Table 1 shows that the KMO measure is 0.608 which shows that the sample for the factor analysis of the EMS was very adequate.

Bartlett's test is another indication of the strength of the relationship among variables of a particular instrument. This tests the null hypothesis that the correlation matrix is an identity matrix. An identity matrix is matrix in elements which all of the diagonal are 1and all off diagonal elements are 0. From the same Table 2, the **Bartlett's test** of sphericity was significant. That is, its associated probability (0.000) was less than 0.05, and was small enough to reject the null hypothesis. This means that correlation matrix for the EMS is not an identity matrix

Table 2: Communality values of items of EMS

Item statement	Initial	Extraction
1. I have a keen sense of curiosity.	1.000	.696
2. When I see a complicated piece of machinery, I always like to find out how it works.	1.000	.422
3. I always actively seek as much information as I can in a new situation.	1.000	.570
4. I consider myself to be a person who take action when I'm curious about something.	1.000	.742
5. I find myself being curious about a lot of things and people I encounter in life.	1.000	.410
6. I have at least one area of interest that I am passionate about in my life.	1.000	.407
7. I think business value creation is the company owner's concern.	1.000	.309

8. I am able to define science problem in terms of value creation.	1.000	.091
9. I think business risk assessment is the business manager's duty.	1.000	.092
10. I have no idea how to assess business risk.	1.000	.102
11. I am able to learn from failure.	1.000	.376
12. I believe the ability to cope with failure can be improved through training.	1.000	.208
13. I am able to act effectively and creatively in difficult situations.	1.000	.380
14. I am able to use the means at my disposal to handle situations effectively.	1.000	.380
15. I have the ability to anticipate technical developments by interpreting surrounding *societal* trends.	1.000	.146
16. I have the ability to anticipate technical developments by interpreting surrounding *economic* trends.	1.000	.707
17. I pay attention to the inefficiency in the market.	1.000	.575
18. I actively think about how to correct inefficiencies in the market.	1.000	.231
19. I agree creative thinking skills can be acquired through training.	1.000	.453
20. I sometimes have innovative ideas for products or services.	1.000	.122
21. I believe a problem can be understood better if it is considered in relation to the whole?	1.000	.439
22. I am able to apply systems thinking to solve complex problems.	1.000	.535
23. I am able to tell if it is technically feasible to develop a new product or service.	1.000	.185
24. I am able to apply logical thinking to gathering and analyzing information.	1.000	.721
25. I am able to apply logical thinking to designing and solving problems.	1.000	.439
26. I am confident in leading a team to work on a project.	1.000	.497
27. I always maintain a good interpersonal relationship in a team.	1.000	.493
28. I am able to identify potential stakeholders for a new product or service.	1.000	.553
29. I am able to address stakeholder interests in a business plan.	1.000	.344

30. I am able to communicate science solution in economic terms.	1.000	.249
31. I am able to substantiate claims with data and facts.	1.000	.146
32. I have a clear plan for my professional development.	1.000	.438
33. My career goal is to become an excellent scientist.	1.000	.401
34. My career goal is to become a scientist with an entrepreneurial mindset.	1.000	.362
35. I have had exposure to entrepreneurship before my university education.	1.000	.527
36. There is/are entrepreneur(s) among my relatives.	1.000	.228
37. I'd like to take some entrepreneurship courses in university.	1.000	.580

Extraction Method: Principal Component Analysis.

Table of communalities shows how much of the variance in the variables has been accounted for by the extracted factors. It shows that item 1 which says "*I have a keen sense of curiosity*" had communality value of 0.696 meaning that 70% of the variance in I have a keen sense of curiosity is accounted for. Also, item 2 with communality value of 0.422 means that 42% of the variance in *"When I see a complicated piece of machinery, I always like to find out how it works"* is accounted for. This follows for other items in Table 2. However, item 8 had the smallest communality value of 0.091 while item 24 had the highest communality value of 0.72.

Total Variance Explained

Table 3: Eigenvalues of the items of EMS

	Initial Eigen values			Extraction Sums of Squared Loadings		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	6.274	16.956	16.956	6.274	16.956	16.956
2	4.019	10.862	27.818	4.019	10.862	27.818
3	3.167	8.561	36.378	3.167	8.561	36.378
4	2.577	6.965	43.343			
5	2.250	6.082	49.425			
6	2.059	5.566	54.991			
7	1.822	4.925	59.915			
8	1.649	4.457	64.372			
9	1.463	3.953	68.326			
10	1.310	3.540	71.866			
11	1.263	3.413	75.280			
12	1.178	3.184	78.463			
13	1.115	3.013	81.476			
14	.867	2.344	83.821			

15	.806	2.178	85.998
16	.668	1.804	87.803
17	.616	1.664	89.466
18	.551	1.489	90.955
19	.477	1.290	92.245
20	.413	1.117	93.362
21	.391	1.056	94.418
22	.372	1.006	95.425
23	.335	.905	96.330
24	.264	.712	97.042
25	.225	.609	97.652
26	.162	.437	98.089
27	.156	.422	98.510
28	.112	.303	98.814
29	.102	.275	99.089
30	.097	.261	99.350
31	.077	.208	99.558
32	.062	.167	99.726
33	.033	.090	99.816
34	.031	.084	99.900
35	.023	.063	99.963
36	.013	.035	99.998
37	.001	.002	100.000

Table 3shows all the factors extractable from the analysis along with their eigenvalues, the percent of variance attributable to each factor, and the cumulative variance of the factor and the previous factors. It shows that the first factor accounts for 17% of the variance, the second 11% and the third 9%. All the remaining factors are not significant.

Scree Plot

The scree plot is a graph of the eigenvalues against all the factors. The graph is useful for determining how many factors to retain. The point of interest is where the curve starts to flatten. It can be seen from the Figure 1 below that the curve begins to flatten between factors 3 and 4 and also that factor 4 has an eigenvalue of less than 1, so only three factors have been retained for EMS factor analysis (first, second and third factors).

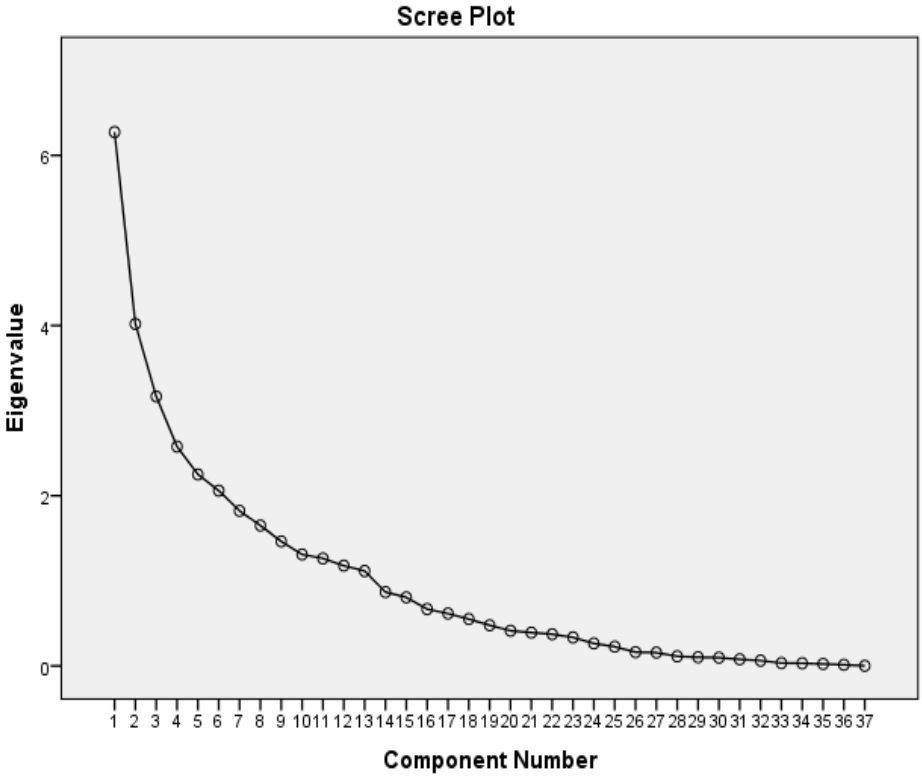

Figure 1: Screen plot for the EMS

Component (Factor) Matrix

Table 4below shows the loadings of the ten variables on the three factors extracted. The higher the absolute value of the loading, the more the factor contributes to the variable. The gap on the table represents loadings that are less than 0.3. In order words, the bench mark for the selection of the items was 0.5 and we suppressed all loadings less than 0.3.

Table 4: Component Matrix for the items of EMS

	Component		
Item Statement	**1**	**2**	**3**
1. I have a keen sense of curiosity	.474		
2. When I see a complicated piece of machinery, I always like to find out how it works		.391	
3. I always actively seek as much information as I can in a new situation	.357		
4. I consider myself to be a person who take action when I'm curious about something	.820		
5. I find myself being curious about a lot of things and people I encounter in life.		.450	
6. I have at least one area of interest that I am passionate about in my life.			.605
7. I think business value creation is the company owner's concern			.506
8. I am able to learn from failure			.610
9. I believe the ability to cope with failure can be improved through training	.343		
10. I am able to act effectively and creatively in difficult situations		.461	
11. I am able to use the means at my disposal to handle situations effectively	.456		
12. I have the ability to anticipate technical developments by interpreting surrounding *societal* trends		.354	
13. I have the ability to anticipate technical developments by interpreting surrounding *economic* trends			.816
14. I pay attention to the inefficiency in the market	.552		
15. I actively think about how to correct inefficiencies in the market			.380
16. I agree creative thinking skills can be acquired through training	.607		
17. I sometimes have innovative ideas for products or services			-.310
18. I believe a problem can be understood better if it is considered in relation to the whole	.589		
19. I am able to apply systems thinking to solve complex problems	.552		
20. I am able to apply logical thinking to gathering and analyzing information	.750		

21. I am able to apply logical thinking to designing and solving Problems	.656
22. I am confident in leading a team to work on a project	.584
23. I always maintain a good interpersonal relationship in a team	.590
24. I am able to identify potential stakeholders for a new product or service	.647
25. I am able to address stakeholder interests in a business plan	.561
26. I am able to communicate science solution in economic terms	.433

Extraction Method: Principal Component Analysis.
a. 3 components extracted.

Table 4 shows that items 1, 3, 4, 9, 11, 14, 16, 18, 19, 20, 21, 22, 23, 24, 25 and 26 loaded more than 0.3 on factor 1.Items 2, 5, 10, and 12 loaded more than 0.3 on factor 2 while items 6, 7, 8, 13, 15 and 17 loaded more than 0.3 on factor 3. This implies that items 1, 3, 4, 9, 11, 14, 16, 18, 19, 20, 21, 22, 23, 24, 25 and 26 are more related to factor 1. Item 2, 5, 10, and 12 are more related to factor 2 while item 6, 7, 8, 13, 15 and 17 are more related to factor 3. The other remaining 11 items (item 27, 28, 29, 30, 31, 32, 33, 34, 35, 36 and 37) of the original version of EMS did not survive the factor analysis and thus, were dropped.

Reliability of EMS

Internal Consistency Reliability

Table 5: Reliability Analysis of the PSEQ

Cronbach's Alpha	N of Items
.798	26

The internal consistency reliability of the 26 items of EMS was estimated as 0.798 using Cronbach alpha method. This value confirmed that the EMS is a reliable instrument for measuring entrepreneurial mindset of undergraduate students.

Table 6: Mean Responses of Undergraduate Students on their Level of Entrepreneurial Mindset

Item Statement	**Mean**	**Std. Deviation**
1. I have a keen sense of curiosity	3.20	.89
2. When I see a complicated piece of machinery, I always like to find out how it works	2.89	1.06
3. I always actively seek as much information as I can in a new situation	3.43	.76

4. I consider myself to be a person who takes action when I'm curious about something	3.39	.78
5. I find myself being curious about a lot of things and people I encounter in life.	3.22	.79
6. I have at least one area of interest that I am passionate about in my life.	3.18	1.13
7. I think business value creation is the company owner's concern	2.97	.99
8. I am able to learn from failure	2.77	.92
9. I believe the ability to cope with failure can be improved through training	2.75	.92
10. I am able to act effectively and creatively in difficult situations	2.81	1.05
11. I am able to use the means at my disposal to handle situations effectively	3.35	.85
12. I have the ability to anticipate technical developments by interpreting surrounding *societal* trends	3.43	.64
13. I have the ability to anticipate technical developments by interpreting surrounding *economic* trends	3.14	.79
14. I pay attention to the inefficiency in the market	3.04	.67
15. I actively think about how to correct inefficiencies in the market	2.68	.84
16. I agree creative thinking skills can be acquired through training	2.77	.89
17. I sometimes have innovative ideas for products or services	2.81	.75
18. I believe a problem can be understood better if it is considered in relation to the whole	2.64	1.05
19. I am able to apply systems thinking to solve complex problems	3.29	.89
20. I am able to apply logical thinking to gathering and analyzing information	3.18	.78
21. I am able to apply logical thinking to designing and solving Problems	3.22	.77
22. I am confident in leading a team to work on a project	2.97	.90
23. I always maintain a good interpersonal relationship in a team	2.85	.86
24. I am able to identify potential stakeholders for a new product or Service	3.10	.79
25. I am able to address stakeholder interests in a business plan	3.27	.78
26. I am able to communicate science solution in economic terms	3.16	.80
Overall Mean	2.89	.67

Table 6 shows the mean responses of the undergraduate students on their level of EMS. It shows that the overall mean response of the students is 2.89 with a standard deviation of 0.67. This implies that the students have high level of entrepreneurial mindset.

Norming of EMS on Undergraduate students of different areas of Specialization

Table 7: Mean Responses of Students of different areas of Specialization on their Level of EMS

Area of Specialization	N	Mean	Std. Deviation	Decision
Biology	75	3.68	.67	Very High
Chemistry	36	3.15	.63	High
Physics	15	3.10	.84	High
Mathematics	3	2.27	.23	Low
Integrated Science	15	3.21	.66	High

Table 7 shows that students who specialise in Biology Education had mean responses of 3.68 with a standard deviation of 0.67; those who specialise in Chemistry Education had mean responses of 3.15 with a standard deviation of 0.84; those who specialise in Physics Education had mean responses of 3.10 with a standard deviation of 0.84; those who specialise in Mathematics Education had mean responses of 2.27 with a standard deviation of 0.23 while those who specialise in Integrated Science had mean rating of 3.21 with a standard deviation of 0.66. This shows that the Biology Education students had very high level of EMS, those of Chemistry, Physics and Integrated Science Education had high level of EMS while those of Mathematics Education had low level of EMS.

Table 8: Analysis of Variance of the difference in the Mean Responses of the Students on the Level of EMS

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3274.130	4	818.533	8.074	.000
Within Groups	14091.870	139	101.380		
Total	17366.000	143			

significant (p< .05)

Table 8 shows that there is significant difference in the entrepreneurial mindset mean ratings of undergraduate students of different areas of specialization, F (1, 139) = 8.074, p = .000. This shows that the extracted entrepreneurial mindset scale of 26items is influenced by the areas of specialization of the students as a norm.

Discussion of the Findings

This finding revealed that the 37-item entrepreneurial mindset scale was factorially reduced to 26-item using undergraduate final year students of University of Nigeria, Nsukka. This indicates that the validated 26-item EMS can be used in

measuring the entrepreneurship mindset of the undergraduate students. This study is similar with the study of Li, Harichandran, Carnasciali, Erdil, and Nocito-Gobel (2016) on development of an instrument to measure the entrepreneurial mindset of engineering students adopted Kern Entrepreneurial Engineering Network (KEEN) assessment instrument consisting of 37 items, which showed an exploratory factor analysis of a pilot instrument resulted in a 29-item solution. Additional reliability analysis based on Cronbach's alpha suggested further reduction of items with low internal consistency. Finally, a preliminary instrument with 27 items loaded on 9 factors measuring the entrepreneurial mindset was established. This study is also in agreement with Maduako (2017) in a study on development and validation of entrepreneurship mindset of secondary school students which indicated that the 30-item entrepreneurial mindset scale developed by the researcher was factorially reduced to 22-item using senior secondary school three (SSS3) in Anambra Central Senatorial zone of Anambra State, though the level of students used are different for both studies.

This study also found that the items of the EMS correlated very well meaning that the items are very closely related to entrepreneurship mindset of the students. By way of norming, the EMS was found to be influenced by the area of specialisation of the students, meaning that the instrument should be used with caution when measuring the entrepreneurial mindset of students of different areas of specialization.

Conclusion and Recommendations

The researcher had factorially validated EMS using final year students of Science Education and came up with a 26-item EMS. Thus, EMS can be used to measure the entrepreneurship mindset of undergraduate students in Nigerian, Universities. However, the items of EMS are dependent on the area of specialization. Based on that, the following recommendations were made;

1. Both state and federal governments should make provisions for graduates of higher institutions to harness their entrepreneurial skills after graduation since they have shown positive mindset toward entrepreneurship.
2. This entrepreneurship mindset scale should be used to determine the mindset of final year students of the tertiary institutions on entrepreneurship.
3. Frantic efforts should be made by the Department of Science Education in order to help the students of mathematics education improve on their entrepreneurial mindset by organizing free seminars, conference and workshops for students.
4. Caution should be taken when using this entrepreneurship mindset scale because of the fact that area of specialization had significant influence on the scale.

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