



# UMYU JOURNAL OF EDUCATIONAL RESEARCH



*A Publication of the*

Faculty of Education, Umaru Musa Yar'adua University, Katsina, Nigeria

**Open Access / ISSN: 2141-7881**

**Date Received:** 12/10/2024

**Date Accepted:** 21/01/2025

## **Coping with Emerging Educational Challenges in the Mid of Global Economic Crises; An Empirical Evidence of Sagone and Decaroli's Academic Self-Efficacy Scale**

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### **Abstract**

The paper discussed the general steps taken in the validation of the Undergraduate Academic Self-Efficacy Scale (UASES) adapted from Sagone, and De-Caroli, (2014). The instrument is on 4-points Likert Scale format, with 27 items. The validation involved 200 undergraduates of Federal University Dutsin-ma, Katsina State. Face, content and construct validity as well as internal consistency reliability were sought. The instrument was validated by the experts. Statistical Package for Social Sciences (SPSS) aided the analysis. Content validity Ratio (CVR) was established; the analysis showed has 0.93 validity ratio. To establish the construct validity of the instrument, discriminant validity process was adopted. Pearson Products Moment Correlation Coefficient was used in the analysis; and good discriminant validity index of .084 was obtained between UASES and Copenhagen Study Burnout Scale (CSBS). The study also revealed overall internal consistency reliability coefficient of,  $\alpha = .892$  the instrument showed high reliability coefficient. It was therefore concluded and recommended that the instrument is valid and reliable to collect data on Academic Self-efficacy among undergraduates in north-western Nigeria as one of the challenges of university education.

**Keywords:** Empirical evidence, Academic Self-efficacy, Validation, Educational-challenge.

### **Introduction**

The problem of academic self-efficacy among undergraduates in north-western part of Nigeria seems to increasingly become a source of concern. It involves the inability of undergraduates to strongly believe that they can successfully attain the academic tasks expected of them. Students are expelled from the university because they engage in misconduct in exams and eventually they will be sent out of the school. It is observed by the research that another problem that further complicates the issue of poor academic self-efficacy in northern Nigeria is lack of local and relevant instrument to measure the construct. Most of the existing instruments such as Self-efficacy Scale of Schwarzer and Jerusalem (1995) were developed to measure. The purpose of establishing reliability and validity in research is essentially to ensure that data are sound replicable, and the results are accurate. The evidence of validity and reliability are prerequisites to ensure the integrity and quality of a measurement instrument (Kimberling & Winterstein, 2008). By this, it means the validation of the instrument was done in order for it to be reliable in finding out the magnitude of the problem and for it to have cultural validity in terms of language and content relevance. Validation in research involves the prior process of ensuring that an instrument can measure what it purposed to measure and that the results obtained can be reliable. This is ensured by pilot testing the instrument on the segment of the population that has the same characteristics with larger population. The aim of university education in Nigeria is to produce graduates with strong belief in capability of themselves with

regard to academic achievement but in Nigeria, there has been outcry over the years against the academic achievement due to poor academic-self-efficacy among undergraduates especially in northwest. It seems to be an undisputed fact in north western Nigeria that undergraduates have problems of low academic self-efficacy which in most cases led to the expulsion of the undergraduates.

The study was on the procedures and techniques employed in the establishing the psychometric properties of the adapted instrument to be used in gathering data on Academic Self-Efficacy among Undergraduates in Northwest Zone, Nigeria. The purpose of establishing reliability and validity is essentially to ensure that data about academic self-efficacy to be obtained using UASES remains sound, replicable, and the results from it are accurate. Many studies may failed to meet the qualitative finding if the qualities of data collection instrument are not checked properly. In researches where the data collection instruments established to measure the construct was used in other parts of the world, validation of the modified instrument in the context of the proposed study area could not be overlooked. This is with a view to ensure that the instrument has cross-cultural validity; meaning it can as well measure the same construct in the intended study area. As an adapted instrument, it has undergone modifications by the team of five experts; Pilot testing it therefore becomes paramount to ensure that the instrument can be valid and reliable in the present context.

The gap of inadequacy of locally validated instrument to measure academic self-efficacy among undergraduates in the universities of North West zone Nigeria called for the conduct of the study. It is in view of the above, that the researcher finds it very important to investigate on the appropriateness of the instrument to appraise the level of Academic Self-efficacy among undergraduates. The main purpose of the study was to examine the psychometric properties of the adapted instrument to ensure that it can measure Academic self-efficacy among undergraduates studying various courses in the public universities of northwest zone, Nigeria.

### **1. Objectives of the Study**

The following objectives were set to be achieved in the study; they are;

- i. To establish the face validity of Undergraduates Academic Self-efficacy Scale.
- ii. To establish the construct validity of Undergraduates Academic Self-efficacy Scale.
- iii. To establish the Internal Consistency reliability of Undergraduates Academic Self-efficacy Scale.

### **2. Research Questions**

The following research questions were set to guide the study.

- i. What is the face validity of Undergraduates Academic Self-efficacy Scale?
- ii. What is the construct validity of Undergraduates Academic Self-efficacy Scale?
- iii. What is the Internal Consistency reliability of Undergraduates Academic Self-efficacy Scale?

### **3. Methodology**

The study employed descriptive survey research design. The sample size of validation covered 200 randomly selected undergraduates that were in level 400 from Federal University Dutsin-

ma (FUDMA) Katsina State. The distribution of the sample by gender is 118 males (59%) and 82 (41%) females. FUDMA was chosen to test the instrument because it was one of the public universities in the study area; whose composition of the students is from all the nooks and cranny of not only North Western Nigeria but the nation at large. More so, since the students have similar characteristic generalization is obvious.

#### 4. Data Collection Instrument

Undergraduate Academic Self-efficacy Scale (UASES) was used to collect the data for the study. The instrument was the modified version of Academic Self-efficacy Scale (ASES) developed by [Sagone and De-Caroli \(2014\)](#). Initially, ASES contained 28 items in a 7-points Likert Scale, ranging from “Not at all efficient” to “Completely efficient”. The scale was developed in four subscales (7 items in each) which include *Self engagement, Self-oriented decision making, others oriented problem solving and Interpersonal climate*. The psychometric properties of the instrument depicted its suitability to extract information about Academic Self-efficacy among undergraduates.

The construct validity of original instrument was established using factorial analysis. Thus, the factor structure of the instrument was found to have four distinct factors as mentioned earlier. The factors loadings for factor 1 ranged from 0.50 to 0.68 that of factor 2 ranged from 0.33 for item 8 to 0.66. Also the factor loadings for factor 3 ranged from 0.50 to 0.73, while that of factor four ranged from 0.44 to 0.66. The extraction method involved was Principal Component Analysis (PCA), while Varimax rotation Method was employed with Keiser Normalization. The Keiser Meyer-okin (KMO) measure of sampling adequacy was excellent (0.856), indicating that the validation sample was adequate. Also the Bartlett’s test of Sphericity was acceptable ( $X^2 = 2574.34$ ,  $df = 378$ ,  $P < 0.001$ ). This is an indication of the strength of the correlation among majority of the items in each subscale. The reliability of ASES was established using Cronbach alpha method. Thus, the internal consistency reliability of the overall scale was  $\alpha = 0.88$ , and all the subscales demonstrated acceptable levels of reliabilities. With regard to the scoring, ASES is a 28 item measure of Academic Self-efficacy among university students. The value mark given for each of the response were; ‘*Not at all efficient (1), “Not Efficient (2) Somehow not efficient (3), “Undecided (4) “Somehow efficient (5) “Efficient, (6) “Completely efficient (7)*. The highest mark to score by a respondent is 196 marks, and the lowest score is 28 marks. The total number of the university students used to establish the psychometric properties of ASES was 267.

#### 5. Modification of UASES

The title of the instrument was modified to Undergraduates Academic Self-Efficacy Scale (UASES). To ensure that the modified instrument has cross cultural validity, the responses options were modified to a 4-points Likert format of *much unlike me (1), unlike me (2), like me (3) and much like me (4)*. It was also observed that all the 28 items of the former scale were written with a running header question; however they were modified to statement format; for the places where the language does not seem to fit in the context, the grammar was modified too. For instance, item 1 “How much do you think you’re able to prepare the subject expected in your training programme”, item 2 “How much do you think you’re able to put in place strategies useful to learn subjects you never study before”, item 3 “How much do you think you’re able to keep your attention during your teacher’s lesson” were all modified. Item 1 was changed to “I prepare well for the courses expected to be taught in my programme”, for item 2 “I put in place proper strategies to learn courses I never studied before”, and for item 3 “I pay attention during lectures”. Similar pattern of modification was carried out for all the 28 items contained in the scale. With regard to the updated scoring, the highest marks to be scored was

112, and the lowest was 28 marks.

## Description of UASES

The instrument is now a 27 items instrument in a 4-points Likert Scale format with no negative item. It is designed in 3 subscales with the polytomous responses options of *Much Unlike me*, *Unlike me*, *Like me*, and *Much Like me*. The distribution of the items based on the subscales are;

- A. Self-engagement (items 1, 2, 3, 4, 5, 6, & 7)
- B. Self-oriented Decision Making (items 8, 9, 10, 11, 12, 13, & 14)
- C. Others' Oriented Problem Solving (items 15, 16, 17, 18, 19, & 20)
- D. Interpersonal Climate (items 21, 22, 23, 24, 25, 26, & 27)

It is worth noting that former instrument was a 28 items scale but the former item 15 was problematic and the SPSS software recommended for its removal in order for the scale to get a stronger reliability in the context of the present study and it was consequently dropped. As for the scoring of ASES, it began with response option *Much Unlike me* 1, *Unlike me* 2, *Like me* 3, and *Much Like me* 4. The lowest composite score for the whole scale is 27 marks, and the highest marks is 108. The highest level of Academic Self-efficacy ranges from 68 – 108, and the lowest level is 27 – 67 marks.

## 6. Validation of UASES

### Face and content validity

Face validity is the extent to which, on the surface, an instrument measures a particular characteristic and Content validity is the extent to which a measurement instrument is a representative sample of the construct being measured (Paul & Ellis, 2015). To ascertain the face and content validity of the instrument, the modified version of the instruments was taken to the experts for vetting. The experts were from Bayero University Kano, University of Ibadan, Federal University Dutsin-ma and Umaru Musa Yar'adua University Katsina. As for the face validity, all the observations and the suggestions raised regarding the suitability of the language were effected before taking the adapted instrument to the sampled undergraduates. The experts established the face and content validities using the following ratings;

[ 1 ] means the content is suitable when after little modification is applied or as it is.

[ 0 ] means the content is not suitable at all.

The content validity was calculated using the formula;

$$\text{Content Validity Index (CVI) of an item} = \frac{ne - N/2}{(N/2)}$$

Where

**ne**: number of panellists that tick

**N**: total number of panellists

$$\text{Content Validity Ratio (CVR) of an instrument} = \frac{\text{CVI}}{\text{Number of items}}$$

The critical value of 5 panellists is 0.99. The closer to this value the higher the quality of an item or instrument however an item with CVI below 0.49 should be eliminated.

**Table 1. Content Validity Index (CVI)**

	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Ne	CVI
Item 1	1	1	1	1	1	5	1
Item 2	1	1	1	0	1	4	0.6
Item 3	1	1	1	1	1	5	1
Item 4	1	1	1	1	1	5	1
Item 5	1	1	1	1	1	5	1
Item 6	1	0	1	1	1	4	0.6
Item 7	1	1	1	1	1	5	1
Item 8	1	1	0	1	1	4	0.6
Item 9	1	1	1	1	1	5	1
Item 10	1	1	1	1	1	5	1
Item 11	1	1	1	1	1	5	1
Item 12	1	1	1	1	1	5	1
Item 13	1	1	1	1	1	5	1
Item 14	1	1	1	1	1	5	1
Item 15	1	1	1	1	1	5	1
Item 16	1	0	1	1	1	4	0.6
Item 17	1	1	1	1	1	5	1
Item 18	1	1	1	1	1	5	1
Item 19	1	1	1	1	1	5	1
Item 20	1	1	1	1	1	5	1
Item 21	1	1	1	1	1	5	1
Item 22	1	1	1	0	1	4	0.6
Item 23	1	1	1	1	1	5	1
Item 24	1	1	1	1	1	5	1
Item 25	1	1	1	1	1	5	1
Item 26	1	1	1	1	1	5	1
Item 27	1	1	1	1	1	5	1
<b>Average CVI</b>	1.00	0.93	0.96	0.93	1.00		0.93 (CVR)

Note [Table 1](#) shows that based on the experts' rating, the instrument has very good content validity ratio of 0.93. The assessment of the experts showed that the instrument can measure Academic Self-Efficacy among undergraduates of North West zone, Nigeria.

### Construct Validity of UASES

Construct validity of the instruments was established using discriminant validity. It is a subtype of construct validity which is also known as divergent validity which refers to the extent to which a test or an instrument is not related to others that measure different constructs. The expectation is that two instruments that reflect different construct should not be highly related to each other. If they are then you cannot say with certainty that they are not measuring the same construct. Thus discriminant validity is an indication of the extent of the difference between constructs ([Nikolopoulou, 2022](#)). To establish the construct validity of UASES, discriminant validity process used.

### 7. Analysis Procedure.

The 200 copies of each of the 2 instruments; Undergraduates Academic Self-efficacy (UASES) and Copenhagen Study Burnout Scale (CSBS) were coded in the SPSS and were subjected to

Pearson Products Moment Correlation to determine the internal consistency reliability and the indices of the discriminant validity index. The summary of discriminant validity analysis is contained on table 2.

**Table 2. Discriminant Validity of UASES**

Instrument	R	P	N
1 Undergraduates Academic Self-efficacy Scale	-0.084	0.235	200
2 Copenhagen Study Burnout Scale			

Note from Table 2 that the correlation coefficient between CSBS and ASES was .084. It was earlier mentioned that low correlation is expected between two instruments that measure different constructs or domains for good discriminant validity.

### 8. Reliability of UASES

As mentioned above, the use of internal consistency reliability was adapted using Cronbach’s alpha statistic to establish the reliability of the instrument. The alpha provides a coefficient of inter-item correlations, that is, the correlation of each item with the sum of all the other relevant items, and is useful for multi-items scales. (Cohen, Manion, & Morris, 2018). Cronbach’s Alpha is considered suitable for determining the inter items reliability of the instrument because it is designed in polytomous responses options with subscales.

**Table 3 Reliability Coefficient of UASES**

Instrument	Cronbach’s Alpha	No. of Items
Undergraduate Academic Self-efficacy Scale	0.892	27

Note that Table 3 provides the reliability coefficient of the modified (adapted) instrument. From the analysis on the table, Undergraduate Academic Self-efficacy Scale with 27 items showed  $\alpha = .892$ . Based on the obtained Cronbach’s alpha coefficient the instrument was found to be reliable because the coefficient exceeded the minimum value of  $\geq 0.7$  as recommended by Paulsen and Brckalorenz (2017). The results of the later reliability analysis showed the modified instrument has strong internal consistency index .892. Table 4 depicts the suitability of the instrument to be used in the main study by juxtaposing the former and validated psychometric properties of the adapted instrument.

**Table 4: Comparison of former and Validated Psychometric Properties of UASES**

Instrument	Former Reliability coefficient	Pilot Test Reliability coefficient
Undergraduate Academic Self-efficacy Scale	0.88	0.892

Note that Table 4 compared the psychometric properties of the adapted instrument based on what the developers of the instruments had obtained and what was revealed by the results of the pilot test, the modified instrument is very much reliable.

### 9. Conclusion and Recommendation

To this end, the results of the validity and reliability analysis obtained from the pilot test of the adapted instrument were good enough. It was therefore concluded that Undergraduates’ Academic Self-efficacy scale is valid and reliable to instrument to measure Academic Self-

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**Appendix I**

**Undergraduates Academic Self-Efficacy Scale (UASES)**

*(Adapted from Sagone & De-Caroli, 2014)*

The scale measures the belief you have to succeed in your study and everyday life in your campus. There are no right and wrong response. Read each statement and chose the option that best describes your confidence.

1. *Much unlike me*, 2. *Unlike me*, 3. *Like me*, 4. *Much like me*,

	<b>Self-engagement</b>	<b>MU</b>	<b>U</b>	<b>L</b>	<b>ML</b>
1	I prepare well for the courses expected to be taught in my program				
2	I put in place proper strategies to learn subjects I never studied before				
3	I pay attention during lectures				
4	I link between topics of different courses to understand how they are related				
5	I often make an effort even in those subjects I do not like				
6	I have the courage to study even without help				
7	I often try to achieve a stated objective				
	<b>Self-oriented Decision Making</b>	<b>MU</b>	<b>U</b>	<b>L</b>	<b>ML</b>
8	I avoid being wrongly influenced by others in my future decisions				
9	I often manage difficult situations				
10	I ensure that my professional choices are related to my future ambitions.				
11	I can take risky decision if necessary				
12	I reason out the situations and choose what is best for me				
13	I react properly while facing a failure				
14	I avoid being caught in situations I disapprove				
	<b>Others'-oriented Problem Solving</b>	<b>MU</b>	<b>U</b>	<b>L</b>	<b>ML</b>
15	I talk about my difficulties with teachers				
16	I sometimes express doubts and uncertainties about the lecturers' lesson				
17	I often ask lecturers for help to solve problems I don't understand				
18	I often discuss an unjust evaluation				
19	I modify rules dictated by other people				
20	I always try to understand the reasons for my failure when it happens.				
	<b>Interpersonal Climate</b>	<b>MU</b>	<b>U</b>	<b>L</b>	<b>ML</b>
21	I often ask other people for help to overcome difficulties				
22	I contribute to building a positive atmosphere in the relationships with my colleagues				
23	I cooperate with my colleagues in group activities				
24	I establish good relationships with my colleagues				
25	I avoid facing unnecessary conflicts				
26	I share with my parents the difficulties and problems I have at the university				
27	Sometimes I accept rules I do not agree with for the sake of retaining relationships				