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Development And Factor Structure Of Adolescents' Academic Self-Concept Scale Among Senior Secondary Schools In Rivers State

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ABSTRACT

This study focused on development and factor structure of the Adolescents' Academic Self-Concept Scale among senior secondary schools in Rivers State (ASSL).The study was borne out of the observation that there was a dearth of contextualized instrument to measure adolescents' academic self-concept among students in senior secondary two. The study was guided by two objectives and research questions. Classical Test Theory (CTT) and the principles of test development and validation guided the study. Instrumentation design was used for the study, with Senior Secondary Student two students as the target population in Rivers State. A multistage sampling technique was used to arrive at 2,400 as the sample size. A total of 120 items were initially developed, after the first validity, reliability and modification of the 120 items, only 68 items were suitable for further analysis. Subsequent analysis using rotated components matrix yielded 54 items under four separate but related components (scales) which are self-esteem, ideal self, self-image, and self-awareness. Based on the findings, it was concluded that 54 items out of 120 initial items generated made up the Adolescents' self-concept scale with four (4) components (scales).

Keywords: Adolescents, factor structure, Self-Concept Scale, secondary schools

INTRODUCTION

The construct of self-concept has attracted ample attention from psychologists throughout the centuries. As simple as the question "who are you''? appears, it is capable of eliciting several kinds of responses. While some individuals might find it difficult to respond, others may have idea of what to say in response to the question. Some persons may go ahead to give a physical description of themselves, while others may mention their profession. To others, it is an answer that talks about religion, while some may focus on their trait or temperaments. All these responses come from an inner sense of "who you are" and this specific term is known as self-concept in psychology.

A famed psychologist, a theorist and clinician, Carl Rogers as cited by McLeod, (2014), defined self-concept as the organized, consistent set of perceptions and beliefs about oneself. The self is what refers to who you are as a person. Self-concept is the entire knowledge we have about who we are in different facets of life. It is the perception of a person's physical, emotional, social, academic, and spiritual standing and everything that makes up who an individual is (Neill, 2005). Self-concept is formed and also transformed in an individual as he or she grows. It is multidimensional and stems down into different aspects of one's life.

According to Nwankwo (2010), self-concept has three components which are: self-image, self-esteem, and ideal self. An adolescent may have different idea of who he or she is socially and who he or she is in terms of physical appearance. This shows that self-concept relates to other several self-forms such as self-esteem, self-image, ideal self, self-awareness, self-efficacy and self-actualization. It also relates to

personal trait and belief. All these help an individual to have a perfect clutch of who one is. Many have taken self-concept to be another self-construct, though they are related, but self-concept is more complex than any other self-construct, such as self-esteem, self-image, ideal self, self-awareness, self-efficacy and self-actualization

Self-esteem is a component of self-concept, and also synonymous to self-worth. This is the sense of one's own value. Smith and Mackie (2007) defined it as the positive or negative evaluation of the self. It encompasses beliefs about oneself. The self-esteem of a man will enable him to say "I am competent'', I can do it. It triggers emotional state of victory, or failure as the case may be. Psychologists see self-esteem as a relatively lasting personality trait, which can predict certain outcomes such as happiness, satisfaction, academic achievement, criminal behavior and relationships (Orth & Robbins, 2014).

Self-esteem describes an individual overall subjective emotional evaluation of his or her worth, it is the attitude and judgment of oneself towards self. It is the cognitive and emotional evaluation of an individual with respect to previous experience (McLeod, 2014). When an adolescent has a healthy and higher sense of self-esteem, it can contribute to a higher self-concept, and to measure this construct, a well-developed and validated self-esteem subscale is needed.

Self-image is another component of self-concept, it is how an individual sees himself or herself. It is the mental picture, which could come from self, how others see you, or how you perceive others see you. Nwankwo (2010) sees self-image as ego identity, the way a person thinks he or she is. Self-image is important in self-concept of an individual because, it gives good psychological health which includes the influence of our body image on one's inner personality (McLeod, 2014). At times, we may perceive ourselves as beautiful or ugly, tall or short, good or bad etc. Self-image could affect the way an adolescent thinks, feels, behaves or responds to life issues. Therefore, in order to have a correct measurement of adolescent's self-image a well-developed and validated self-image subscale is needed.

McLeod (2008) described ideal self as a component of self-concept, it is a constant thought of an individual about his activities and how such individual would like to be in the future. This thought may come from ones performance in daily activities. The ideal self at different stages of life differs, this may stem up from ones ambition and goals. At times what an adolescent wants to be in the future may not be consistent with what actually happens, this means that incongruence has occurred, but where an adolescent becomes what he wants to be in the future, then a state of congruence exists and it is capable of giving an individual a high sense of self-esteem which is important for facing life challenges (McLeod, 2014).Therefore, in order to achieve this, a correct measurement of adolescents' ideal self should be done with the aid of a well-developed and validated ideal self inventory. While these components of self-concepts have received considerable attention in the scientific literature, it is clearly realized that individuals have different level of self-concept in different areas of their lives. One of such is academic self-concept.

Academic self-concept is one of the most important variables in the academic domain, due to its significant influence on appropriate cognitive functioning (Santana, et al 2009). It directly affects learning processes (Vidals, 2005), academic achievement, and expectations of students (Henson & Heller, 2000). Additionally, it helps to create various cognitive and self-regulative strategies (Zimmerman, 2000), which reflect on academic performance (Campo-Arias et al., 2005).

Academic self-concept is multidimensional. Many studies viewed each academic subject area as a dimension, e.g. Science, History Mathematics, Spanish (Marsh, 2002). However, most research focuses only on Spanish and mathematics, setting other taken subjects aside (Marsh, 2002; Plucker & Stocking, 2001). This causes some problems associated with evaluation and self-concept, especially when viewed in adolescents. However as an individual grows, there is increase in the number of subject areas, i.e., dimension they can handle (Campbell, Krueger, & Vohs, 2003). Self-concept and academic achievement are dual directional relationship. The self-concept of an individual contributes to a greater extent on his academic achievement. Likewise, adolescents or students with a positive academic-concept may display positive academic achievement, whereas students with negative academic-concept may display negative academic achievement.

Positive academic self-concept in an adolescents or students can lead to statements like "I am capable of solving that problem" I feel good about my person, while a negative academic self-concept in an adolescent may produce expressions like "I can't do well in that position" I don't have anything good to offer". Marsh (2004), discovered that students with higher positive academic self-concept attain higher academic success. Muijs (2011), also agreed that academic self-concept impacts academic achievement.
To achieve all the benefits of academic self-concept, a good measuring scale for academic self-concept is a necessity. It is against this background that these researchers is compelled to embark on this study titled the identification of the factor structure and development of the adolescents' academic self-concept scale among secondary schools in Rivers State.

Purpose of the study

The aim of this study is to develop and validate an academic self-concept scale for adolescents among senior secondary school students in Rivers state, Nigeria. In specific terms, the objectives of the study are to:

1. Develop an academic self-concept scale (AASS) for adolescents with the following subscales: self-esteem, self-image, ideal self, self-awareness, self-efficacy and self-actualization.
2. Establish the factor structure of academic self-concept scale (AASS) for adolescents using Confirmatory Factor Analysis (CFA)

Research Questions

The following research questions guided the study:

1. What is the factor structure of academic self-concept scale (AASS) for adolescents using Confirmatory Factor Analysis (CFA)?
2. What are the developed items of academic self-concept scale (AASS) for adolescents?

METHODOLOGY

Design

This study employed instrumentation research study, this is because the study focused on development and validation of academic self-concept scale for adolescents which is concerned with the procedure of test development on the basis of test theories in the measurement and evaluation of psychological or social attributes of human constructs in cognitive and non-cognitive domains.

Sampling and Sampling Techniques

The sample of this study consisted of 2,400 respondents (senior secondary school two (SSS2 students). Based on the recommendation of Nwana (2008), a 5% of the population was calculated to be 2025, but the researcher choice to use 2,400 respondents. A multistage sampling method was used to arrive at this sample size.

At stage one, the researchers applied non-proportional stratified random sampling technique using the three senatorial districts: the Rivers East, Rivers West and Rivers South as the strata. Later, four schools from each of the three senatorial districts were chosen irrespective of the number of schools in each stratum. This gave a total of twelve (12) secondary schools. At stage two, the researchers used another non-proportional stratified random sampling where each of the twelve (12) schools was taken as a stratum to select two thousand and four hundred (2,400) SSS2 students. To obtain this number irrespective of the population of SSS2 students in each of the twelve (12) schools chosen, only two hundred (200) SSS2 students were selected using simple random sampling by balloting technique. At stage three, the researchers paid careful attention to selection of the two hundred students using simple sampling by balloting following ratio 2 Male to 3 Female students. This gave a total of 960 male students which was 40 % of the sample size and 1440 female students which was 60% of the sample size, both Male and Female gave a total of two thousand and four hundred SSS2 students (2400) for the study.

Development of Item Statements

The researchers adopted the classical test theory (CTT) for the study because the research seeks to identify how norming criteria for AASS can be established because of the interest in the performance of the complete sample of respondents to the scale generally (Orluwene 2012, Iweka 2014, Opara 2016.)

The researchers developed items of the "Academic Self-Concept Scale (ASCS)", this instrument was used to investigate the academic self-concept scale of STUDENTS. The instrument was developed and validated by the researcher to measure the academic self-concept of adolescents using a self-report model of measures to assess the attitude or feelings of adolescent to the six (6) components of academic self-concept scale which are referred to as the subscales of the instrument. The initial AASS comprised of one hundred and twenty (120) test items each subscale has ten (10) positive and ten (10) negative test items on the respective component of academic self-concept scale.

Item Writing

The construct of academic self-concept scale (AASS) was based on self-concept theories which defined self-concept as the totality of our beliefs, preferences, opinions and attitudes organized in a systematic manner towards our personal existence (Carl Rogers in Mc Leod 2014).

The initially developed instrument had different sections, section A, requests the students' demographic information and information about their school. Section B are sets of items which assessed the respondent's feelings on self-esteem (SE) subscale, Section C , are items which assessed the respondent's feelings on self-image (SI) subscale , Section D consists of items which assessed the respondent's feelings on Ideal-self (IS) subscale , Section E are sets of items which assessed the respondent's feelings on self-efficacy (SEF) subscale , Section F are items which assessed the respondent's feelings on self-awareness (SAW) subscale and Section G are made up of items which assessed the respondent's feelings on self-actualization (SAC) subscale. Each of this scales were made up of ten (10) positive and ten (10) negative items, giving a total of twenty items in each section and a total of one hundred and twenty items in the entire scale

Determination of the Scale Point

Section B to G were place on seven point Likert scale of measurement with rating options of Almost Always True (AAT), Usually True (UT), Often True (OT) Occasionally True (OCT), Rarely True (RT), Usually Not True (UNT), Almost Never True (ANT).

The AAT, UT,OT,OCT,RT, UNT and ANT were weighted as 7,6,5,4,3,2, and 1 respectively for positively skewed items and the reverse rating of AAT,UT,OT,OCT,RT,UNT, and ANT, were weighed as 1,2,3,4,5,6 and 7 respectively for the negatively skewed items.

Face and Content Validity

The generated test items were given to five (5) experts in measurement and evaluation. Three are in the Department Of Educational Psychology, Guidance and Counseling, Faculty of Education, University of Port Harcourt and two in the Department of Education Foundations Guidance and Counseling, Faculty of Education, University of Uyo, Akwa-Ibom State to inspect, edit, suggest and approve the construct measured in the area of clarity of words, simplicity of statement, grammatical error and to also ascertain the content validity of the instrument in terms of adequate coverage of the intended content of the construct .The final validity of this instrument was sought through the researcher's supervisors who are experts in the field of study. Based on the suggestions of the experts, some corrections were made, thereafter, the instruments is valid in relation to face and content wise. According to Elliot, Kratochwill, Cook and Travers (2000), validity is an important characteristic of a good measurement instrument if a test is not valid for the purpose used, it has a little or no value.

Trial Testing of the Instrument

According to Sidhu (2005), trial testing provides information for the step by step process of standardization. Trial testing is the administration of the edited form of the preliminary copy of the test items to a small but representative group of respondents who will actually take the test, (Orluwene 2012). Hair (2010, 2012) and Awag (2014, 2015) agreed that 200 sample size is adequate for analysis, based on this, the researcher sought the reliability of the instrument by administering the preliminary copy to a sample size of 300 respondents. Thereafter, the scores generated from the responses of the items were subjected to various statistical analysis. First, the response scores on the one hundred and twenty (120) items were subjected to factor analysis with a forced extraction on six factors, items loaded on different factors that make up the different sections of the scale. Tabachnick Fidell, (2011) recommended an

inspection of the correlation greater than 0.30, however, the researcher chose to use a baseline of 0.40, which implies that any item that is less than 0.40 was not displayed in the factor analysis because they do not meet up the baseline set for the extraction. Based on this, one hundred and thirteen (113) items were selected while seven items were dropped. The seven items are 17, 23, 29, 39, 40, 57, and 110.

Item 17. On the whole, I am not satisfied with myself being a student.

Item 23. As a student, I am poor at most sport and physical activities.

Item 29. I dislike talking about my look.

Item 39. I need to slim down so as to look beautiful.

Item 40. I always like to look at the mirror, it makes me to appreciate my person.

Item 57. Many graduate are yet to be gainfully employed, therefore I don't need to waste my time in school.

Item 110. There is too much competition in my class. My efforts made no difference.

However, out of the 113 items, 35 items loaded on Factor 1 representing subscale 1, and their correlation values ranged from 0.453 - 0.760, then, 30 items loaded on Factor 2 representing subscale 2, their correlation values ranged from 0.404 - 0.669, while 21 items loaded on Factor 3, representing subscale 3 and their correlation values ranged from 0.432 - 0.704.In the same manner, 13 items loaded on Factor 4, representing subscale 4 and their correlation values ranged from 0.414 - 0.684. Again on Factor 5, 9 items loaded, representing subscale 5 and their correlation values ranged from 0.456 - 0.661, finally, 5 items loaded on Factor 6, representing subscale 6 and their correlation values ranged from 0.456 - 0.579. See Appendix 2, Table 1 to 6

Moreover, the responses from the items were also subjected to item-total correlation. It was then observed that for subscale 1, the correlation coefficient range from -0.717 to 0.815 indicating that some of the items negatively correlated with the total scale, while some others are not. So to promote the homogeneity among the items, the ones with negative item – total correlation coefficients and those below the baseline of 0.40 were eliminated. Thus 11 items were removed and only 24 items were retained. For subscale 2, it was observed that the correlation coefficient ranged from -0.645 to 0.649 implying that some of the items negatively correlated with the entire scale, while some others were not, therefore, to promote the homogeneity among the items, the ones with negative item – total correlation coefficients and those below the baseline of 0.40 were eliminated. Thus 14 items were removed and only 16 items were retained. This same process was done for subscales 3 to 6.For subscale 3, the item – total correlation coefficients ranged from -0.523 to 0.633, the negative items were eliminated. Thus 11 items were dropped and only 10 items were retained. Likewise, for subscale 4, it was observed that their correlation coefficients ranged from -0.471-0.336 indicating that some of the items were at variance with the entire scale, while some others were not, some fell below the base line of 0.40, therefore, to promote the homogeneity among the items, the ones below the baseline and others with negative item – total correlation coefficients were eliminated. Thus 7 items were removed and only 6 items were retained.

Unlike other subscales, subscale 5 had item-total correlation coefficients which ranged from 0.556 to 0.781, there were no negative items and none was below the baseline of 0.40, and thus all the 9 items were retained. Also, it was observed that the correlation coefficients for subscale 6 ranged from 0.342 to 0.664 indicating that some of the items were negatively correlated with the total scale while others were not, some also fell below the baseline of 0.40, therefore, to promote the homogeneity among the items, the ones below the baseline and others with negative item – total correlation coefficients were eliminated. Thus, an item was removed and only 4 items were retained.

Editing and selection of items

Based on the corrected Item-total correlation, the researcher deleted all items with negative coefficients and items below the baseline of 0.40 coefficient matrix. Only these 69 items were selected for subsequent analysis. Items selected are listed below.

Administration of Instrument

The researcher with the help of three research assistants administrated the instrument. The assistants were educated on the importance of the study, method and mode of conduct to the respondents and the importance of the confidentiality of the respondents. A total of two thousand and four hundred copies of the instrument were distributed, all were collected at the point of completion for collation and data analysis.

3.6 Method of Data Analysis

After the instrument has been administered, they were all collated and analyzed using various statistical analysis. Research question one was answered using Principal component analysis to determine the factor structure of the instrument, upon which the subsequent items in the instrument were determine.

PRESENTATION OF RESULTS

Research Questions

Research Question One: *What is the factor structure of Adolescent Academic self-concept scale (AASS) using confirmatory factor Analysis (CFA)?*

To provide answer to research question one, the items that were selected were run through, a series of principal component analysis, using the forced extraction method. This method follows the recommendation of Everett and Hothorn (2010). The result of the principal component Analysis (PCA) is displayed in table 1

Table 1: Principal Component Analysis

Total Variance Explained									
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	30.178	43.736	43.736	30.178	43.736	43.736	21.248	30.794	30.794
2	7.093	10.280	54.017	7.093	10.280	54.017	8.632	12.510	43.304
3	5.492	7.960	61.976	5.492	7.960	61.976	7.441	10.784	54.088
4	4.960	7.189	69.165	4.960	7.189	69.165	7.339	10.636	64.724
5	2.470	3.580	72.745	2.470	3.580	72.745	4.284	6.209	70.933
6	2.099	3.043	75.788	2.099	3.043	75.788	3.349	4.854	75.788
7	1.440	2.088	77.875						
8	1.235	1.790	79.666						
9	1.206	1.748	81.413						
10	1.056	1.530	82.944						
11	1.004	1.455	84.399						
12	.885	1.283	85.681						
13	.759	1.101	86.782						
14	.716	1.037	87.819						
15	.673	.976	88.795						
16	.623	.903	89.698						
17	.572	.828	90.526						
18	.557	.808	91.334						
19	.497	.720	92.054						
20	.492	.713	92.766						
21	.453	.656	93.423						
22	.382	.554	93.976						
23	.352	.511	94.487						

24	.327	.474	94.961						
25	.301	.436	95.397						
26	.279	.405	95.802						
27	.257	.373	96.175						
28	.246	.357	96.532						
29	.218	.316	96.848						
30	.202	.293	97.140						
31	.184	.267	97.408						
32	.167	.242	97.649						
33	.155	.225	97.874						
34	.144	.208	98.082						
35	.127	.184	98.267						
36	.124	.180	98.447						
37	.121	.175	98.621						
38	.110	.159	98.780						
39	.092	.134	98.914						
40	.083	.120	99.034						
41	.074	.107	99.142						
42	.068	.098	99.240						
43	.063	.091	99.331						
44	.059	.085	99.416						
45	.054	.079	99.494						
46	.054	.078	99.573						
47	.048	.070	99.643						
48	.041	.059	99.702						
49	.036	.053	99.755						
50	.034	.050	99.804						
51	.032	.047	99.851						
52	.029	.042	99.893						
53	.024	.034	99.928						
54	.023	.033	99.961						
55	.009	.013	99.973						
56	.006	.009	99.982						
57	.006	.009	99.991						
58	.003	.004	99.996						
59	.002	.003	99.999						
60	.001	.001	100.000						
61	8.935E-17	1.295E-16	100.000						
62	7.897E-17	1.145E-16	100.000						
63	5.441E-17	7.886E-17	100.000						
64	7.623E-18	1.105E-17	100.000						
65	-4.360E-18	-6.319E-18	100.000						

66	-1.413E-17	-2.049E-17	100.000						
67	-3.590E-17	-5.203E-17	100.000						
68	-1.322E-16	-1.916E-16	100.000						

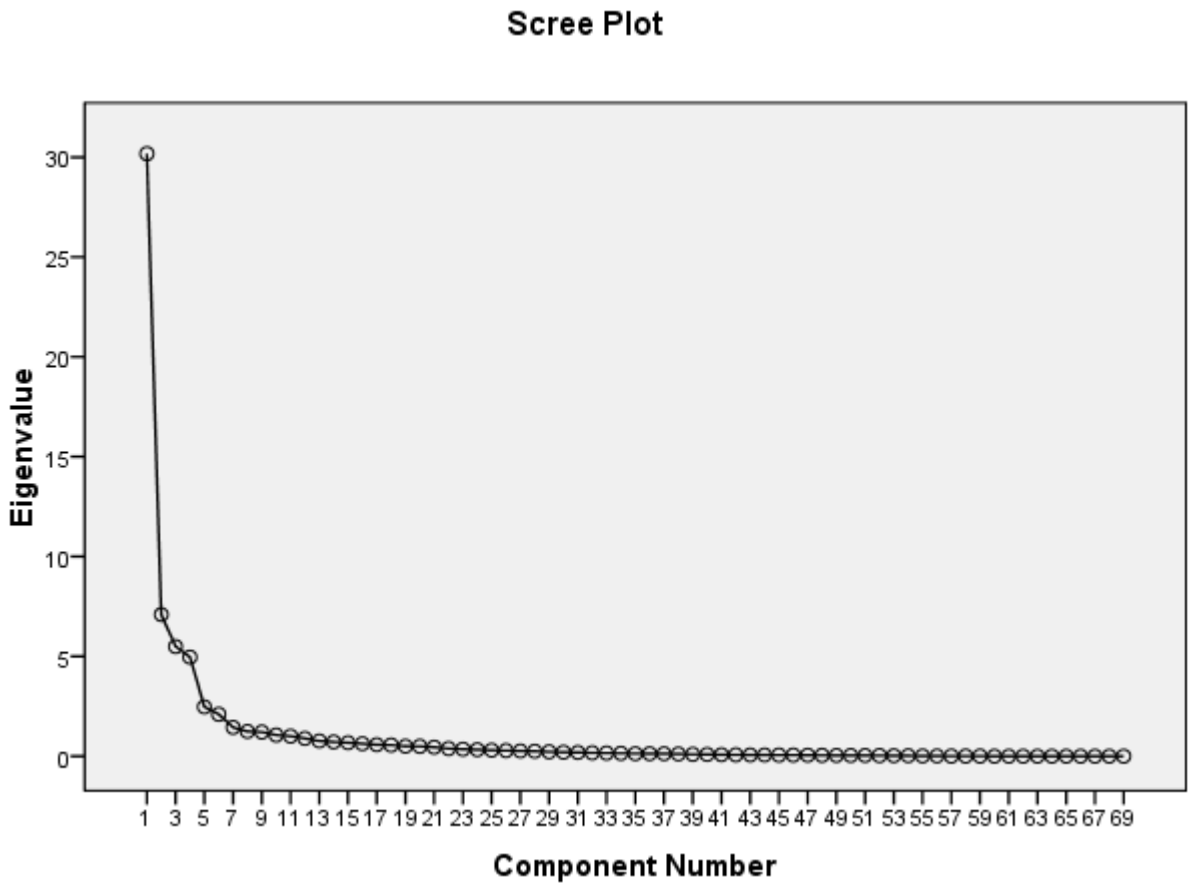

Figure 1 Is the Scree plot of Principal Component Analysis using Principal Component Analysis)

Principal Component Analysis was conducted on the 69 items, and force extraction of 6 factors was requested, the result yielded 6 components with more than 1% of variance. Critical observation of the scree plot associated with the PCA (Figure 1) revealed a change in the shape of the plot, which is the inflection point, this occurred at the sixth point in the line.

Table 2: Principal Component Total Variance

Total Variance Explained						
Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	30.178	43.736	43.736	21.248	30.794	30.794
2	7.093	10.280	54.017	8.632	12.510	43.304
3	5.492	7.960	61.976	7.441	10.784	54.088
4	4.960	7.189	69.165	7.339	10.636	64.724
5	2.470	3.580	72.745	4.284	6.209	70.933
6	2.099	3.043	75.788	3.349	4.854	75.788

From the Table 2 above, it can be observed that the first component accounted for 30.794% of the total variance, the second component accounted for 12.510% of the total variance, the third component accounted for 10.784 % of the total variance, the fourth component accounted for 10.636 % of the total variance, the fifth component accounted for 6.209 % of the total variance and the sixth components accounted for about 4.854% of the total variance in the responses of the students in adolescent academic self-concept scale (AASS).

In addition to this, rotated component matrix, revealed that different items loaded on different components. However, an item was not displayed, this implies that it didn't meet up with the baseline set for the extraction, therefore, 68 items loaded on different Subscales. The component subscales were labeled based on the common themes of the items under them. A cut- off of 0.40 was used based on the recommendation of Tabachnick Fidell, (2011)

A summary of the items, their factor loading, Eigen values, explained variance original code and component source are shown in table 4.3below.

Table 3 Components of Subscale 1 to Subscale 6

Subscale1					
Original code	Component source	Item Statement.	Factor loading	Eigen value	Explained variance
65	SAC	Achievement of set goals make my life worth living.	0.867	43.736	30.794
94	SEF	I always jot down good note during class instruction.	.854		
69	SAW	I have always accomplished my decision.	.847		
27	SI	Hard work pays so I work hard for my academic success.	.844		
71	SAW	I feel I am a bundle of disappoint in school	.842		
62	SAW	I like to face academic challenges, it pushes me to study hard for success.	.842		
64	SAW	I assume I am physically challenged	.836		
38	SI	I always retain my good grade in all subjects.	.836		
70	SAW	I am unstoppable, I will be what I want to be.	.835		
58	IS	There is nothing in me to be proud of as a student	.806		
107	SAC	I always set my priorities right as a student.	.806		
4	SE	I achieved the goals I set in my study last term.	.799		
43	IS	I may not be able to do great things now, but, I do small things in a great way.	.796		
49	IS	I always want to be a voice not an echo, and that is who I am.	.792		
61	SAW	I pick up courage, when challenged by my classmate during examination.	.786		
111	SAC	It is hard for me to learn with other classmates.	.780		
78	SAW	I feel good about my gender.	.780		
67	SAW	I will change my look if I have my way	.777		
23	SI	I always like to plan my school work ahead of the day.	.760		
118	SAC	Sometimes I feel am not useful at all among my classmate.	.760		
39	SI	I can settle down to study even if there are other interesting things to do.	.752		
26	SI	I direct my energy toward the subject I want to improve on.	.744		
15	SE	I am ugly as a student.	-.710		
28	SI	I am proud of myself in the class due to my performance	.699		
102	SAC	I may need to select a toning soap and cream so that I can look beautiful	.658		
91	SEF	I always enjoy using the library to get information about my homework.	-.618		
7	SE	I have never made a personal reading time table	-.616		
31	SI	I don't always have the scores I wish to have in most	.607		

		of my examination.			
101	SAC	I feel loved by my classmate because am good looking	.583		
54	IS	I don't belief I can always get what I want, no matter how I try hard.	-.567		
48	IS	I don't believe I can be who I want to be, because the price is high.	.538		
52	IS	I wish I am as important as my friend in class	.502		
46	IS	I have a very short learning-span in class.	.477		
44	IS	My grade at every examination is not too far from what I aimed at.	.460		

Subscale 2

Original code	Component source	Item Statement.	Factor loading	Eigen value	Explained variance
56	IS	I can only read and study under a conducive environment.	.888	54.017	12.510
3	SE	I find it difficult to settle down and read personally.	.857		
30	SI	I fear facing challenges because I don't want to fail.	.855		
21	SI	Every one cannot secure white collar job.	.851		
87	SEF	Most of the time, I don't understand my mood in class.	.758		
24	SI	I am optimistic about a better grade at every examination.	.758		
90	SEF	I don't always understand what was taught in class.	.628		
81	SEF	I am not impressed to work hard, one can make it through diverse ways	.604		
95	SEF	I wish I could love myself as a student.	.585		
34	SI	I always have an idea of a starting point of all my academic goals.	.571		
18	SE	My background is a great limitation to my academic success in school.	.559		
114	SAC	Not only schooling, can give me success in life.	.416		

Subscale 3

Original code	**Component source**	**Item Statement.**	**Factor loading**	**Eigen value**	**Explained variance**
100	SEF	I can't picture a way to achieve my life goal	.953	61.976	10.784
17	SE	I found it difficult to realize when I am under academic pressure	.951		
106	SAC	I found it difficult to realize when I am under academic pressure	.951		
113	SAC	I make more failure than success as a student.	.950		
8	SE	I am as better as other students in my class.	.948		
88	SEF	I enjoy sport and physical exercise in school	.944		

Subscale 4

Original code	**Component source**	**Item Statement**	**Factor loading**	**Eigen value**	**Explained variance**
3	SAW	I learn other trades after school hours.	.903	69.165	10.636
5	SAW	I am not confident of myself during examination.	.902		
21	SE	I follow my time table for personal studying.	.901		
27	SE	My concentration during teaching-learning process is very low.	.813		
31	SE	I have my personal time table.	.813		
39	SE	I am popular because of my body shape	.565		
40	SI	I feel like a fool among my classmate	.565		
45	SI	I have problem with most of my subjects	.525		

Subscale 5

Original code	Component source	Item Statement	Factor loading	Eigen value	Explained variance
48	IS	I am afraid of what lies ahead of me, therefore I don't want to	-.728	72.745	6.209

		think about the future.			
49	IS	Most times I follow majority ideas, thoughts and actions.	-.680		
50	IS	I always visit a special place to study during holidays to avoid distractions.	.420		

Subscale 6

Original code	Component source	Item Statement	Factor loading	Eigen value	Explained variance
38	SE	As a student, I am poor at most sport and physical activities.	-.728	75.788	4.854
33	SE	I am not better than any of my classmate	.593		
56	SEF	I always concentrate during lesson on subject taught.	-.550		
57	SEF	I prefer practical subjects in class.	-.528		
61	SEF	All students can't perform well to teacher's expectation.	-.471		

From the analysis of the data shown in Table 3, subscale 1 had 34 items. These items reflected the positive and negative feelings of the respondents on their self-esteem. Items under this subscale accounted for 30.794% with Eigen value of 43.736 of the variance in the entire scale as shown above in Table 2

The result from Table 3 (subscale 2) revealed twelve (12) items. They reflected the positive and negative feelings of respondents on their ideal--self. This subscale had an Eigen value of 54.017 and accounted for 12.510% of the variance in the entire scale as shown in Table 2.

The result from Table 3 (subscale 3) revealed six (6) items from the initial scale, it had an Eigen value of 61.976, and accounted for 10.784% of the variance in the entire scale as shown in Table 2. These six (6) items reflected the positive and negative feeling of the respondents on their Self- image.

The result from Table 3 (subscale 4) revealed eight (8) items from the initial scale, it had an Eigen value of 69.165, and accounted for 10.636% of the variance in the entire scale as shown in Table 2. These eight (8) items reflected the positive and negative feeling of the respondents on their Self- actualization.

The result from Table 3 (subscale 5) revealed three (3) items from the initial scale, it had an Eigen value of 72.745, and accounted for 6.209% of the variance in the entire scale as shown in Table 2.These three (3) items reflected the positive and negative feeling of the respondents on their Self- awareness.

The result from Table 3 (subscale 6) revealed Five (5) items from the initial scale, it had an Eigen value of 75.788, and accounted for 4.854% of the variance in the entire scale as shown in Table 2.These Five (5) items reflected the positive and negative feeling of the respondents on their Self- efficacy.

All the items in the six (6) subscales of the Adolescents Academic self-concept scale had a factor loading which were greater than 0.40, except for an item that was not displayed because it fell below the baseline of 0.40, which was taken as the criteria for item inclusion. Based on this, the total number of items is 68.

Summary of AASS Factor Structure Total Variance.

Subscale	Number of item	Subscale name	% of variance	Eigen value
1.	34	Self-esteem	30.794	43.736
2.	12	Ideal self	12.510	54.017
3.	6	Self-image	10.784	61.976
4	8	Self-actualization	10.636	69.165
5	3	Self-awareness	6.209	72.745
6	5	Self-efficacy	4.854	75.788
Total Number of items	68			

Research Question Two: What are the developed items of academic self-concept scale (AASS) for adolescents?

Table 4 Final Items of the Adolescents' Academic Self-Concept Scale

		Almost Always True	**Usually True**	**Often True**	**Occasionally True**	**Rarely True**	**Usually Not True**	**Almost Never True**
S/N	**Items**	7	6	5	4	3	2	1
1	Achievement of set goals make my life worth living.	7	6	5	4	3	2	1
2	I always jot down good note during class instruction.	7	6	5	4	3	2	1

3	I have always accomplished my decision.	7	6	5	4	3	2	1
4	Hard work pays so I work hard for my academic success.	7	6	5	4	3	2	1
5	I feel I am a bundle of disappoint in school	7	6	5	4	3	2	1
6	I like to face academic challenges, it pushes me to study hard for success.	7	6	5	4	3	2	1
7	I assume I am physically challenged	7	6	5	4	3	2	1
8	I am unstoppable, I will be what I want to be.	7	6	5	4	3	2	1
9	There is nothing in me to be proud of as a student.	7	6	5	4	3	2	1
10	I always set my priorities right as a student.	7	6	5	4	3	2	1
11	I achieved the goals I set in my study last term.	7	6	5	4	3	2	1
12	I may not be able to do great things now, but, I do small things in a great way.	7	6	5	4	3	2	1
13	I always want to be a voice not an echo, and that is who I am.	7	6	5	4	3	2	1
14	I pick up courage, when challenged by my classmate during examination.	7	6	5	4	3	2	1
15	It is hard for me to learn with other classmates.	7	6	5	4	3	2	1
16	I feel good about my gender.	7	6	5	4	3	2	1
17	I will change my look if I have my way	7	6	5	4	3	2	1
18	Sometimes I feel am not useful at all among my classmate.	7	6	5	4	3	2	1
19	I can settle down to study even if there are other interesting things to do.	7	6	5	4	3	2	1
20	I direct my energy toward the subject I want to improve on.	7	6	5	4	3	2	1
21	I am proud of myself in the class due to my performance	7	6	5	4	3	2	1
22	I may need to select a toning soap and cream so that I can look beautiful	7	6	5	4	3	2	1
23	I don't always have the scores I wish to have in most of my examination.	7	6	5	4	3	2	1
24	I feel loved by my classmate because am good looking	7	6	5	4	3	2	1
25	I don't believe I can be who I want to be, because the price is high.	7	6	5	4	3	2	1
26	I wish I am as important as my friend in class	7	6	5	4	3	2	1
27	I have a very short learning-span in class.	7	6	5	4	3	2	1
28	My grade at every examination is not too far from what I aimed at.	7	6	5	4	3	2	1

29	I always retain my good grade in all subjects.	7	6	5	4	3	2	1
30	I always like to plan my school work ahead of the day.	7	6	5	4	3	2	1
31	I can only read and study under a conducive environment.	7	6	5	4	3	2	1
32	I find it difficult to settle down and read personally.	7	6	5	4	3	2	1
33	I fear facing challenges because I don't want to fail.	7	6	5	4	3	2	1
34	Every one cannot secure white collar job.	7		6	5	4	3	2
35	Most of the time, I don't understand my mood in class.	7	6	5	4	3	2	1
36	I am optimistic about a better grade at every examination.	7	6	5	4	3	2	1
37	I don't always understand what was taught in class.	7	6	5	4	3	2	1
38	I am not impressed to work hard, one can make it through diverse ways	7	6	5	4	3	2	1
39	I wish I could love myself as a student.	7	6	5	4	3	2	1
40	I always have an idea of a starting point of all my academic goals.	7	6	5	4	3	2	1
41	My background is a great limitation to my academic success in school.	7	6	5	4	3	2	1
42	I cant picture a way to achieve my life goal	7	6	5	4	3	2	1
43	I found it difficult to realize when I am under academic pressure	7	6	5	4	3	2	1
44	I found it difficult to realize when I am under academic pressure	7	6	5	4	3	2	1
45	I make more failure than success as a student.	7	6	5	4	3	2	1
46	I am as better as other students in my class.	7	6	5	4	3	2	1
47	I enjoy sport and physical exercise in school	7	6	5	4	3	2	1
48	I learn other trades after school hours.	7	6	5	4	3	2	1
49	I am not confident of myself during examination.	7	6	5	4	3	2	1
50	I follow my time table for personal studying.	7	6	5	4	3	2	1
51	My concentration during teaching-learning process is very low.	7	6	5	4	3	2	1
52	I have my personal time table.	7	6	5	4	3	2	1
53	I am popular because of my body shape	7	6	5	4	3	2	1
54	I feel like a fool among my classmate	7	6	5	4	3	2	1

From table 4.13, it was observed that the final scale of the Adolescents' Academic Self-concept Scale (AASS) is made up of 54 items under 4 components (subscales). From the tables displayed above, it was

also observed that subscale one which assessed self-esteem had Thirty (30) items, subscale two which assessed Ideal-self had eleven(11) items, subscale three which assessed Self- image had six (6) items, and subscale four which assessed self-awareness had seven (7) items all these subscales were based on seven Likert scale.

Subscale	Number of items	Number of items
1.	Self-esteem	30
2.	Ideal Self	11
3.	Self-image	6
4.	Self-awareness	7
Total		54

DISCUSSION AND CONCLUSION

Factor structure of Adolescents' Academic Self-concept (AASS)

The result obtained from the analysis of the factor structure of the adolescents' academic self-concept scale (AASS) showed that from the total of 120 items initially developed by the researcher, only 68 were suitable for further analysis, then a principal component analysis was utilized to select appropriate items loading, a six factor solution was used. This was based on the screen plot diagram as well as the total variance explained which had a total above 75%.

Using the rotated components component matrix, 54 items under four component (subscale) were developed which is now the final scale. This result revealed that the adolescents' academic self-concept scale (AASS) had a total of 54 items, under four separate, but related subscales (components) of the four subscales (components) were self-esteem, ideal-self, self-image and self- awareness..

The result from this study is similar to that obtained by Batool and Khalid (2011) who found out that an indigenous self-report emotional intelligence scale yielded 10 distinct components, composed of 56 items, however it differs from this instrument (AASS) because it was developed with a Pakistani sample while the AASS study was done using Nigerian sample, also there is a difference in the number of items: AASS comprised of 54 items while their instrument was made up of 56 items lastly, the title of the components they extracted from their instrument differs from the AASS instrument.

The result of this study supports the result obtained by Obushi (2019) who found out that the quality assurance instrument yielded five factors which are school management indices, school resources, teacher effectiveness, learners' outcome and school/community indices. The result also indicated that 147 items of the QAI were reduced to 128 items; which means that the quality assurance instrument items adequately represented indicators of quality in respect to school continuous improvement and sustained development. This implies that the indicators can be identified, assessed and used to make professional judgments about quality, however, it differs to the extent that AASS was done on students' academic self-concept.

Final item of the Adolescents' Academic self-concept scale

The result from the study showed that the final Adolescents' Academic self-concept scale (AASS) had 54 items under four distinct but related components (subscales). These items were developed after the initial analysis of items revealed only 68items that are suitable for inclusion in the instrument for further analysis. Factor analysis showed that only 54 items rotated under four (4) components (subscale) used for the study. This results is in concurrence Obushi (2019) who after a number of factor analysis developed and validated a Quality Assurance Instrument with 128 items out of 147 items involving the five thematic areas considered good enough to determine quality assurance in secondary schools, both study were similar to the extent that they were conducted in the same country and used varimax method as well as internal consistency reliability coefficient to answer research questions. Likewise, the study confirms that which was obtained by Afolabi (2017) who after series of analysis developed a 52 item indigenous emotional intelligence scale under seven well-structured components. The results were similar to the extent that varimax rotation method was adopted for both studies including this one. In addition, both studies were conducted using Nigerian samples. However, the studies had some differences to the extent

that the samples used were from different levels of academics (institutions). Afolabi (2017) used samples made up of university students, AASS used samples comprising of senior secondary school two SS2 students. Okorie, (2018) also did a similar study, who after several analysis developed a scale called emotional and social intelligence scale (ESIS) with 38 items under 10 various dimensions, this was similar to AASS study to the extent that both adopted varimax rotation method, also both studies were conducted using Nigerian samples, however, the studies used samples from different areas of life. Okorie (2018) used samples comprising of workers in oil sector, AASS used sample from educational sector of the same country.

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