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RESEARCH ARTICLE

Validation of the Academic Self-Concept Scale among Secondary School Students of Mbeya City Council, Tanzania

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ABSTRACT

Academic self-concept is a crucial psychological construct underlying a student's beliefs about subjects, the learning process, and educational outcomes. Students' self-belief about subjects and schooling impacts academic performance, consequently affecting educational and career advancement. Studies in Tanzania found that low school motivation, incorrect subject selection, and negative attitudes towards subjects are among several factors impacting secondary school students' academic performance. This study aimed to validate the Academic Self-Concept Scale (Reynolds, 1988) for Tanzanian secondary school students. The study employed a cross-sectional survey design in which 294 and 316 students from public secondary schools of Mbeya City Council in Tanzania students from public secondary schools of Mbeya City Council in Tanzania were conveniently selected. Statistical Package for Social Sciences (SPSS) and Analysis Moment of Structure (AMOS) version 22.0 was used for data analysis. The statistical analysis yielded a four-factor solution explaining 63.70% of the total variance, consisting of 16 scale items. The extracted factors showed acceptable statistical indices as X2/DF=2.42, CFI=.93, GFI=.91, TLI=.91, RMSEA=.067 and SRMR=.062. The scale and its sub-scales demonstrated convergent and discriminant validity as well as adequate internal consistency in Cronbach's Alpha (α>.7). The results show that the four factors of the scale are valid and reliable to measure student's self-perception about their academic ability in Tanzania. According to the study, factors of the scale are reliable and valid for assessing academic self-concept in Tanzanian secondary school students.

Academic performance is a building block and determinant of a person's educational and career goals (International Labour Organization (ILO), 2020; Stipanovic et al., 2017). It is a criterion for judging academic accomplishment in education and training (Green et al., 2006; Marsh & Scalas, 2010). Among other factors related to academic performance, academic self-concept has been reported by several studies to influence the student's academic performance (Burger & Naudé, 2019; Iyengar et al., 2021; Marsh et al., 1988; Shavelson et al., 1976). The authors further clarify that students' academic self-concept underlies their beliefs about studies and schooling in general. According to Shavelson et al. (1976), there are two forms of self-concept: "non-academic self-concept", which encompasses social, physical, and emotional self-concepts, while "academic self-concept" is focused on beliefs, attitudes, and opinions regarding academic endeavours.

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In educational contexts, academic self-concept impacts students' educational and career goals. As Lohbeck (2020) asserts that student's academic success is impacted by their academic self-concept, which is favorably correlated with their self-esteem and self-perception.

Acosta-Gonzaga (2023) stresses that self-esteem is essential for students to engage in the learning process. Similarly, Korkmaz et al.(2021) and Gensowski et al. (2021) explain that self-perceptions relate to achievement in a particular academic discipline and are essential for educational outcomes. The school environment contributes to either a positive or negative development of academic self-concept, which affects the students' well-being and, consequently, their academic achievement (Bowman et al., 2021). The students' perceptions of themselves in the classroom impact their academic achievement, emotional states, self-concept, and self-esteem (Palenzuela-Luis et al., 2022). However, in educational settings, academic self-concept is more pronounced for the student's academic success and educational transition than other forms of self-concept (González-Nuevo et al., 2023).

According to Marsh (1990) and Skaalvik and Hagtvet (1990), students' academic success is influenced by their perception of themselves. Enhancing students' academic self-concept is crucial for the students' educational outcomes. Several models have explained the academic self-beliefs and success, including self-enhancement, which states that academic self-concept determines academic achievement. The skills development model considers that prior academic achievement motivates the development of academic self-concept (Guay et al., 2003; Marsh et al., 2005). The reciprocal model explains that students' perceptions of their academic aptitude and success have an impact on one another (Green et al., 2006; Marsh & Craven, 2006; Marsh & Martin, 2011; Skaalvik & Hagtvet, 1990). The models show that developing positive academic beliefs triggers studying behaviour and, consequently, academic achievement. Bong and Skaalvik (2003) add that academic belief encompasses self-efficacy, which is the ability to accomplish a certain task. Bong and Skaalvik emphasize instilling self-awareness and self-efficacy among students for academic accomplishment. Supervía et al. (2020) and Acosta-Gonzaga (2023) noted that students come from diverse backgrounds; therefore, identifying and supporting them is crucial to addressing their academic challenges.

Additionally, a student's academic performance is influenced by their assessment of their academic abilities and their self-description, which can be both good and negative (Marsh et al., 1988; Marsh & Shavelson, 1985). Student's belief about their academic ability develops through interaction with other students, teachers, and significant others in the environment (Flowers et al., 2011; Hansen & Henderson, 2019; Marsh & Martin, 2011; Perinelli et al., 2022; Reynolds et al., 1980; Seaton et al., 2014). In education, students compare themselves with others in the class or school as well as against the set academic standards through which their academic self-concept develops and is altered (Holm et al., 2020; Marsh et al., 2014; Marsh & Seaton, 2015; Skaalvik & Skaalvik, 2002). Students with low perception about their academic ability have low academic achievement, low school motivation, drop out, and wrong choice of subjects for their educational and career pathways (Trautwein & Möller, 2016). Educators, administrators, and school counsellors must evaluate students' academic self-concept to identify and develop support and intervention programmes for students with negative self-perceptions regarding their studies (Perinelli et al., 2022). In this situation, Postigo et al. (2022) suggest that students require assistance from classmates, parents, instructors, and others to cultivate a positive self-perception.

Reynolds's Academic Self-concept Scale (1988)

The milestone of the academic self-concept scale can be traced from Reynolds et al. (1980). Reynolds and colleagues initially developed and validated the academic self-concept scale using 427 college students in New York. The authors used the seven characteristics of self-concept, namely multifaceted, hierarchical, organized, stable, developmental, evaluative, and differentiable psychological construct (Shavelson et al., 1976), to develop the scale. Reynolds and colleagues underscore the influence of school environmental factors on the development of academic self-concept, such as reinforcement from teachers, motivation, and interactions with other people. Reynolds and colleagues generated a total of 59 pool items through which the correlation technique was used; items that correlated above 0.3 were included in the scale items. In the analysis, out of 59 pool items, 19 items were excluded, and 40 items were retained to form the final scale. The scale was reliable (α=.91) for assessing the college students' academic self-concept. Later, Reynolds (1988) validated the scale

developed by Reynolds et al. (1980) using 589 college students in New York State through which he grouped the scale items into seven dimensions: grade and effort, study habits, peer evaluation, self-confidence, self-doubt, self-evaluation, and satisfaction. The scale showed high reliability (α=.92), whereas, among the seven dimensions, four showed adequate reliability of above 0.7, whereas the three sub-scales (Self-confidence, Satisfaction, and Self-evaluation) yielded low reliability (α <.70) due to few items in the sub-scales. The analysis yielded 52.6% of the total variance.

Furthermore, there has been extensive use of Reynolds's academic self-concept in education contexts. For example, studies by Morris (2020); Archer (2022); Haktanir et al. (2021), and Karaman et al. (2021) revealed that the scale had strong dependability among college students. The studies also reported that academic self-concept predicted the students' academic performance. In South Africa, Burger & Naudé (2019) used Reynolds's academic self-concept scale to study the predictors of academic success among fourth-year university students. Data analysis showed Cronbach's alpha of 0.92 and academic self-concept was significantly related to academic success among university students. Zheng et al. (2021) selected nine items from the 40 items of Reynolds' academic self-concept scale relevant to studying the influence of learning environments on academic self-concept among Chinese University students. The nine-item scale showed a reliability of 0.92, and further findings revealed that academic self-concept influenced cognitive learning among university students.

Similarly, by focusing primarily on items with strong loading factors, Covarrubias et al. (2020) reduced the 40-item Reynolds scale to 24 items. The condensed scale was used to examine the parent-student dialogue around grades and academic self-concept among Midsize State University students in the United States. The results showed that university students' social environments significantly improve their academic performance and academic self-concept. Conversely, Reynolds' scale was used by Sherrill (2020) to investigate the connection between one's academic self-perception, perceived social support, and internal and extrinsic motivation among North Central University students in the United States. The study revealed no significant relationship among the factors of the scale.

Although Reynolds's scale was developed to assess college students' academic self-perception, the scale has also been used in other levels of education. For example, Griggs (2019) modified Reynolds's scale to study academic belief of dual credit secondary career technical education grade 11th and 12th students, Vermont State, U.S. The study revealed no significant difference in academic self-concept among high school students. Also, the experimental study (Zulkarnaen, 2019) adopted the 40 items of Reynolds's scale to the constructive model of learning Mathematics among 10th-grade senior high students from public schools in Java, Indonesia. The scale showed an adequate reliability of 0.87. The study also found that constructive learning environment contributed to the formation of a positive self-perception about studies. The findings indicate that Reynolds's scale is valid and reliable in various geographical areas and levels of education.

In Tanzania, studies have reported academic difficulties that require intervention. For example, Ndalichako and Komba (2014) found that secondary school students face challenges in selecting subjects as their career pathways due to perceived negative attitudes towards some subjects, especially science subjects. Also, secondary school students have negative attitudes and perceptions and a lack of career awareness due to their diverse backgrounds, which affect school attendance and academic achievement (Pezzulo et al., 2022). Lubawa et al. (2021) admit that psychological challenges are evident among secondary school students in Tanzania. Lubawa and colleagues emphasize providing guidance and counselling services to enhance academic performance among secondary school students. Likewise, Chua and Mosha (2015) stress that proper school administration enhances academic performance. Other studies in Tanzania (Ibrahim et al., 2023; Mbise & Lekule, 2023; Paschal & Mkulu, 2020) found that extracurricular activities and teacher-student interaction, learner-centered teaching and learning approaches are essential strategies for students' schooling motivation, developing self-awareness, and reducing school dropouts. The studies credit psychological support to students for promoting a positive perception of teachers, studies, and the school environment. In the same way, Vaghela (2019) and Mahende (2021) in Tanzania underline that helping students understand their academic abilities is essential for academic achievement. Rugimbana and Mwila (2023) found that female students believe they are

incompetent and low achievers, hence contributing to school dropout and poor academic performance among secondary school students in Tanzania. Rugimbana and Mwila advocate instilling self-awareness among students to realize their societal potential regardless of gender and other socioeconomic tailbacks. Kibona and Nkya (2024) noted gender difference in Science, Technology, Engineering, and Mathematics (STEM) among secondary school students in Tanzania, where male students performed higher than females. The findings call for psychological intervention to raise academic self-efficacy among students.

Overall, research on the adoption, adaptation, and validation of the Reynolds' scale in Tanzania is scarce, despite the fact that studies have shown that the scale has been widely used to assess students' academic self-perception across a range of educational levels and geographic regions. Therefore, the present study focused on validating Reynolds' academic self-concept scale (1988) among secondary school students of Mbeya City Council in Tanzania. The study would contribute to the applicability of the scale in diverse environments.

Materials and Methods

Participants

The present study is quantitative and used a cross-sectional survey design. The study focused on public secondary school students of the Mbeya City Council, Tanzania. Through convenient sampling, two independent groups of form three students from ten secondary schools were selected for two phases of the study: Exploratory factor analysis (EFA) used 294 respondents where among them, 122(41.50%) were males and 172(58.50%) females while confirmatory factor analysis involved 316 among them, 183(57.91%) were males and 133(42.09%) females. The students' age in both cases ranged between 14 and 16 years. According to the education system of Tanzania, form three refers to the third year of study in secondary school.

Instruments

The scale developed by Reynolds (1988) to assess students' belief about their academic ability was used in this study. The scale consists of 40 items rated at four-point Likert scale with rating "1= Strongly Disagree" to "4= Strongly Agree", whereby minimum score=40 and maximum=160. The scale rating ranged from 1= Strongly Disagree and 4= Strongly Agree, whereby the minimum score=40 and maximum=160. The scale has seven subscales: Grade and Effort has eight items (2, 3,4, 7,8,15, 25, 33), for example, "If I try hard enough, I will be able to get good grades"; Study habits with six items (22, 34, 40, 29, 27, and 38) for example, "I feel I do not study hard before the test"; Peer evaluation has eight items (9, 36, 17, 13, 6, 37, 28, and 32), for example, "others view me as intelligent"; Self-confidence has three items (10, 23, 16), for example, "most of the time while taking a test, I feel confident" Satisfaction has four items (31, 35, 1, 20), for example, "Being a student is a very rewarding experience" self-doubt has eight items (11, 30, 39, 21, 14, 24, 26, 5), and self-evaluation consists of three items (19, 18, 12). According to Reynolds, the seven scale factors contributed 52.6% of the total variance explained. The Cronbach's Alpha for the scale was 0.92, indicating strong reliability.

Procedure

The study focused on validating Reynolds's academic self-concept scale among secondary school students of the Mbeya City Council, Tanzania. Secondary schools and higher education in the United Republic of Tanzania use the English language as a medium of instruction; therefore, there was no need to translate the scale because the original scale was in English language. However, due to the difference in study contexts and education level of respondents, the research sought experts' opinions from the Department of Education and Psychology at the University of Mbeya University of Science and Technology and secondary school teachers in Tanzania to modify Reynolds's academic self-concept scale items. As the scale was initially developed for college students, the scale items 13,14,15, 18, 20, 24, 25, 33, 35,37, and 39 were reworded to suit the context of secondary schools. The study was conducted from January to March 2023.

Data Analysis

The study used a statistical package for social sciences (SPSS) and AMOS version 22.0 for data analysis. The collected data were cleaned and coded according to the suggested seven factors of the original scale as GE-Grade and effort, SH-study Habit, PE-Peer Evaluation, SC-Self-confidence, SD-Self Doubt, SE-Self-Evaluation, and SAT-Satisfaction. The negatively worded scale items (4,5,8,11,19,21,22,24,26,29,30,34,38,39

and 40) were reverse-coded. Prior to doing CFA, the researcher employed EFA, which involved principal component analysis (PCA). PCA is a technique of reducing items to a manageable size and determining the structure of the variables (Field, 2018, p. 991). The present study set the extraction of the scale items to eigenvalues above one and a factor loading of 0.4, as used in the original scale (Reynolds, 1988). Also, the Varimax rotation technique was used to determine the distribution of items among factors.

Ethical Statement

Prior to conducting the study, the researcher requested a permission letter for conducting a study from the educational authority of Mbeya Region, Tanzania. Permission to conduct a study was granted in a letter dated 14th November 2022, Ref. No. DA.191/228/01/435. The heads of schools, teachers, and students were fully informed about the study, and the students consented to participate.

Results

In EFA, the investigator started with determination of sample adequacy before further analysis. The analysis provided sufficient Kaiser-Meyer-Olkin (KMO), as suggested by Field (2018, p. 1014) that a value greater than 0.5 is sufficient for the analysis. Table 1 shows the statistical analysis for the sample adequacy.

Table 1. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.806
Bartlett's Test of Sphericity	Approx. Chi-Square	4282.266
	df	780
	Sig.	.000

Source: *Field Data (2023)*

Also, the data set was approximately normally distributed with mean (M)=3.43, standard deviation (SD)=.46, and Skewness=-. 32 and kurtosis =.23.

The researcher performed an EFA to determine the appropriate number of factors explaining the academic self-concept. In the first attempt, the cross-loading, low factor loadings of less than 0.4 and low correlation among scale items through the correlation matrix were used to exclude scale items step by step. The scree plot and eigenvalue above one guided the extraction of the factors (Figure 1). The eigenvalue of one is reasonable for extracting the factors of the construct under study (Field, 2018, p. 1005). The Varimax rotation was also used to determine the distribution of items among the three factors. Figure 1 represents the scree plot in which four ASC scale factors (1, 2, 3, & 4) have been extracted during EFA.

Figure 1. The Scree Plot.

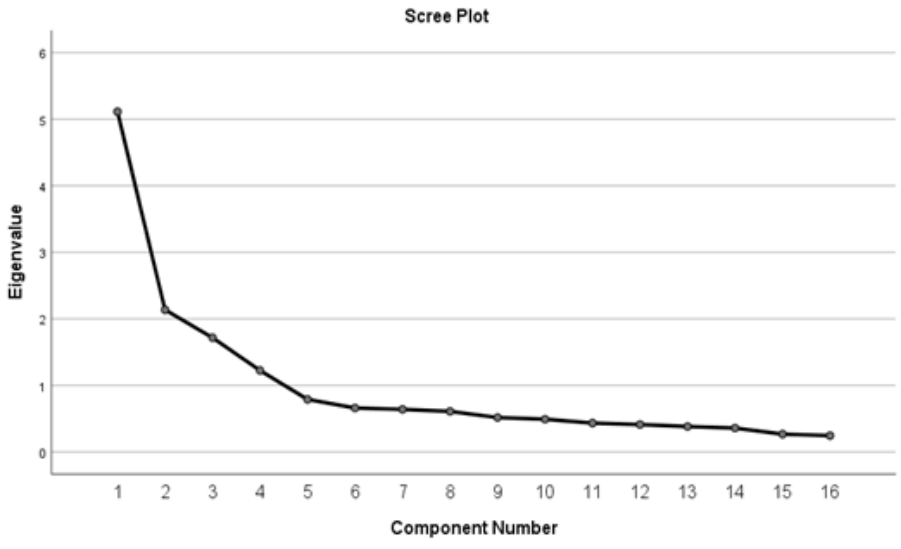


Table 2 shows the eigenvalues above 1 of the extracted factors as 31.96%, 13.35%, 10.73%, and 7.65% giving 63.70% of the total variance. The four-factor solution: grade and effort with six items, self-confidence with three items, study habits with four items and satisfaction with school having three items were extracted.

Table 2. 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	5.113	31.956	31.956	5.113	31.956	31.956	3.603	22.518	22.518
2	2.137	13.353	45.310	2.137	13.353	45.310	2.468	15.423	37.941
3	1.717	10.732	56.041	1.717	10.732	56.041	2.104	13.149	51.090
4	1.225	7.654	63.695	1.225	7.654	63.695	2.017	12.605	63.695
5	.789	4.933	68.629						
6	.660	4.127	72.756						
7	.640	3.999	76.755						
8	.610	3.812	80.567						
9	.518	3.236	83.802						
10	.492	3.077	86.879						
11	.434	2.710	89.589						
12	.412	2.576	92.165						
13	.382	2.386	94.551						
14	.359	2.242	96.794						
15	.268	1.672	98.466						
16	.245	1.534	100.000						

Extraction Method: Principal Component Analysis.

Source: *Field Data (2023)*

Table 3. The Number of Items Extracted and Factor Loadings

Rotated Component Matrix[a]

	Component				
	Factor 1	Factor 2	Factor 3	Factor 4	Communalities
GE7	.846				.739
GE2	.839				.591
GE25	.771				.734
GE3	.758				.610
GE15	.707				.623
GE33	.573				.439
SC23		.842			.742
SC10		.828			.659
SC16		.776			.730
SH34			.779		.629
SH38			.767		.692
SH29			.680		.613
SH27			.550		.495
SAT20				.779	.610
SATI				.737	.645
SAT35				.695	.642

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Source: *Field Data (2023)*

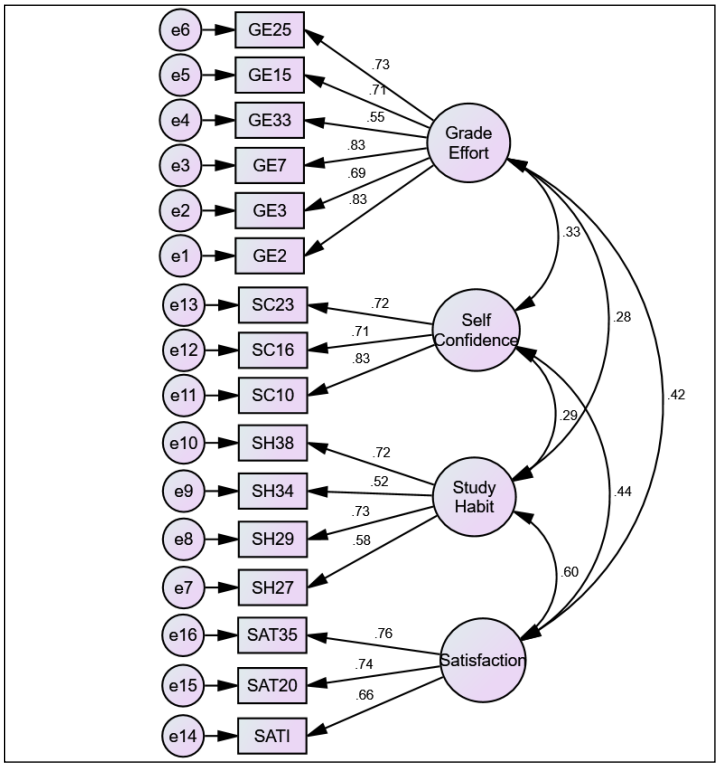
The reliability of the extracted factors in EFA showed adequate reliability: The 16-item ASC scale yielded Cronbach's Alpha (α) of .85, and its sub-scales showed adequate reliability: Grade and Effort (6 items) =.86, Satisfaction (3 items) =.72, study habit (4 items) =.71, Self-Confidence (3 items) =.72.

Table 4. The Scale Items Extracted

Factor		Item	Factor Loadings
Grade and Effort	GE2	"If I try hard enough, I will be able to get good grades in my studies"	.846
	GE3	"I am always rewarded at school when performing well in my examinations".	.839
	GE7	"I do well in my subjects when I spend enough time studying"	.771
	GE15	"In general, I am proud of my examination grades in school"	.758
	GE25	"For me, studying hard gives a good performance"	.707
	GE33	"I usually get the grades I deserve in my subjects"	.573
Study Habit	SH27	"I am good at scheduling my study time".	.779
	SH29	"I would like to be a much better student than I am now".	.767
	SH34	"I do not study as much as I should".	.680
	SH38	"In most of the subjects, I feel my classmates are better prepared than me"	.550
Satisfaction	SAT1	"Being a student is a very rewarding experience"	.779
	SAT20	"I am satisfied with the class assignments that I submit to my teachers"	.737
	SAT35	"I usually feel happy to complete my assignments on time"	.695
Self-Confidence	SC10	"Most subjects are very easy for me".	.842
	SC16	"Most of the time, while taking a test, I feel confident".	.828
	SC23	"Most of the examinations are easy for me".	.776

Source: *Field Data (2023)*

Figure 2. Confirmatory Factor Analysis Path Diagram



Source: *Field Data (2023)*

As a rule of thumb regarding CFA, Hu and Bentler (1999) suggest that "the Root-Mean-Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR)" range from 0 to 1, with a value of less than 0.08 acceptable for the good model fit, whereas Schumacker and Lomax (2010, p. 76) recommends a value of less than .05. Tucker–Lewis Index (TLI) and Comparative Fit Index (CFI) values close to 0.90 or 0.95 indicate a good model fit. CFI and TLI values closer to 1 indicate the best fit of the model (Bentler & Bonett, 1980; McDonald & Marsh, 1990). In addition, the ratio of chi-square to a degree of freedom (CMIN/DF) of 5 or less indicates a good model fit (Wheaton et al., 1977). Therefore, the researcher evaluated the model's fitness using RMSEA, SRMR, TLI, CFI, GFI and CMIN/DF indices. Table 4 represents the indices of the good fit model for CFA.

Table 5. Model Fit Index

Model-Fit Criterion	Acceptable Range	Model Output	Interpretation
X^2/DF	X^2/DF <5	2.42	"Good Fit"
CFI	Closer to 1 (CFI≥.90)	.93	"Good Fit"
TLI	Closer to 1 (CFI≥.90)	.91	"Good Fit"
GFI	Closer to 1 (CFI≥.90)	.91	"Good Fit"
RMSEA	RMSEA .05 to .08	.067	"Good Fit"
Standardized RMR	SRMR<.08	.062	"Good Fit"

Source: *Schumacker and Lomax (2010); Hu and Bentler (1999).*

Convergent Validity

In convergent validity, the factors measuring the same construct correlate significantly (Arthaud-day et al., 2005; Pike, 2006). The validity of the measurement model was assessed by "average variance extracted (AVE)" and "composite reliability (CR)".

Fornell and Larcker (1981) suggest that convergent validity can be assessed by evaluating the AVE of the construct. The AVE of 50% and above is recommended. Fornell and Larcker caution that AVE is conservative, so the reliability of the entire construct can justify the convergent validity even though the value of AVE is less than 50%. According to the analysis, the sub-scales self-confidence, grade and effort, and satisfaction with school showed adequate reliability and AVE above 50% while the AVE of study habit was less than 50%, although its composite reliability (CR) is greater than the threshold value .70. According to the statistical analysis, the values of CR and AVE show that the four factors (Grade and Effort, Study Habit, Satisfaction, and Self-confidence) have convergent validity (See Table 6). Moreover, reliability is the measure of internal consistency of the scale in which a scale is said to be reliable when it has a value of 0.7 and above (Field, 2018, p. 1045). In the present study, the reliability of the scale and sub-scales were assessed using Cronbach's Alpha, where the 16-item ASC scale showed Cronbach's Alpha (α) of .85; and the four sub-scales showed adequate reliability above the threshold (0.7).

Table 6. Convergent Validity

Latent Variable	**Number of Items**	**Cronbach's Alpha (α)**	**CR**	**AVE**
Self_Confidence	3	.80	0.80	0.57
Grade_Effort	6	.87	0.87	0.53
Study_Habit	4	.74	0.74	0.42
Satisfaction	3	.76	0.77	0.52

In addition, Cheung and Wang (2017) clarify that when AVE and standardized factor loadings are less than 0.5, then the convergent validity is not significant. Table 7 shows the standardized loadings. According to Cheng and Wang, high factor loadings indicate convergent validity.

Table 7. Standardized Regression Weights

			Estimate
GE2	<---	Grade_Effort	.826
GE3	<---	Grade_Effort	.691
GE7	<---	Grade_Effort	.828
GE33	<---	Grade_Effort	.554
GE15	<---	Grade_Effort	.706
GE25	<---	Grade_Effort	.730
SH27	<---	Study_Habit	.577
SH29	<---	Study_Habit	.734
SH34	<---	Study_Habit	.523
SH38	<---	Study_Habit	.720
SC10	<---	Self_Confidence	.825
SC16	<---	Self_Confidence	.710
SC23	<---	Self_Confidence	.724
SATI	<---	Satisfaction	.664
SAT20	<---	Satisfaction	.742
SAT35	<---	Satisfaction	.757

Discriminant Validity

Discriminant validity is the tendency of the variables measuring the same construct to correlate more highly with each other than variables measuring different constructs (Schumacker & Lomax 2010). Fornell and Larcker (1981) state that the discriminant validity exists when the square root of the AVE of a latent variable is greater than its correlation with other variables of the construct under study. Also, Campbell and Fiske (1959) posit that discriminant validity can be seen when the variables measuring the same construct demonstrate higher intra-correlations than inter-correlations. Table 8 shows discriminant validity in which the square roots of AVE (the bolded diagonal values) are confined and concentrated to their own factors, which indicates discriminant validity. Also, the square roots of the AVE are greater than the correlations with other latent variables.

Table 8. Discriminant Validity

Latent variable	Self_Confidence	Grade_Effort	Study_Habit	Satisfaction
Self_Confidence	**0.76**			
Grade_Effort	0.33	**0.73**		
Study_Habit	0.29	0.28	**0.65**	
Satisfaction	0.44	0.42	0.60	**0.72**

Discussion

The present study aimed to validate the 40-item Reynolds ASC scale (1988) among public secondary school students of Mbeya City, Tanzania. Initially, the scale was developed to study ASC among college students in the U.S. (Reynolds et al., 1980). Due to respondents' differences in age, socioeconomic status, education, experience, and culture, it is crucial to evaluate a scale's applicability in a variety of settings (Ambuehl & Inauen, 2022). The study used EFA and CFA, as the steps are inevitable are essential for ascertaining the psychometric properties in developing, adopting, and adapting scales (Günal et al., 2020; Lirio et al., 2022; Matovu, 2014). In the current study, the researcher started with EFA, in which the factor loading of 0.4 and eigenvalue of one and above guided the extraction of scale factors. Through step-by-step in EFA, the seven factors of the original scale were reduced to four factors (Grade and Effort, Study habit, Satisfaction, and confidence) comprising 16 items (Fig. 1& Table 1). The four-factor solution yielded 63.70% of the total variance explained. Compared with the original academic self-concept scale, the EFA yielded a seven-factor

solution scale that explained 52.6% of the total variance, while in the present study, the four-factor solution accounted for 63.70% of the total variance. From the seven-factor of the original scale: Grade and Effort comprised eight items (2, 3,4, 7,8,15, 25, 33); Study habits with six items (22, 34, 40, 29, 27, 38); Peer evaluation has eight items (9, 36, 17, 13, 6, 37, 28, 32); Self-confidence has three items (10, 23, 16); Satisfaction has four items (31, 35, 1, 20; self-doubt has eight items (11, 30, 39, 21, 14, 24, 26, 5), and self-evaluation having three items (19, 18, 12). The four-factor solution: grade and effort with six items (2,3,7,15,25,33), for example, "If I try hard enough, I will be able to get good grades in my studies"; self-confidence with three items (10,16, 23), for example, "Most subjects are very easy for me"; study habit with four items (27, 29, 34, 38), for example, "I am good at scheduling my study time" and satisfaction with school having three items (1, 20, 35), for example, "Being a student is a very rewarding experience". The scale items of the four-factor solution loaded onto their respective latent variables.

In addition, the CFA ascertained the relationship among the four factors and variables of the validated ASC scale, as represented by Fig. 2. In addition, the statistical results showed the criteria for the model fit whereby relative Chi-square (X2/DF) =2.42, CFI=0.93, TLI=0.91, GFI=.91, RMSEA=0.067, and SRMR=.062. According to the set standards (Hu & Bentler, 1999; Schumacker & Lomax 2010), the model fit indices indicate that the four factors adequately explain the academic self-perceptions of secondary school students. Using the AVE, CR, a comparison of the square roots of AVE and inter-correlations of the latent variables (Fornell & Larcker,1981), the academic factor-solution of the ASC scale showed convergent and discriminant validity (See Tables 6 & 8). The findings indicate that the four factors feature to explain the ASC among secondary school students. The difference between the original scale and the validated one in the context of Tanzania reflects the idea by Cokley that the understanding of various academic self-concept expressions can vary across ethnic groups (Cokley et al., 2003). Similarly, it should be remembered that the original scale was developed for assessing academic self-concept among college students, so conceptualizing of things varies according to age and exposure to experience, as the present study used secondary school students (Marsh, 1990). The findings are consistent with Zheng et al. (2021), who found that nine items were reliable for studying academic self-concept among Chinese university students. Also, Covarrubias et al. (2020) found 24 items for students' academic self-concept among university students in the US. In addition, Griggs (2019) and Zulkarnaen (2019) in Vermont State, U.S. and Java, Indonesia, respectively, adapted the scale for assessing the academic self-belief of secondary school students. Although initially, the scale was developed and validated among college students, it is valid and reliable even for studying secondary school students' academic self-belief. The findings imply that although the scale can be valid and reliable in one context, it can differ according to the contexts and characteristics of the respondents, hence reflecting the idea that "no one size fits all."

Nevertheless, students' beliefs about subjects and the school's psychosocial environment contribute enormously to the academic and career goals of the student (International Labour Organization (ILO) 2020; Stipanovic et al., 2017). Students in schools need support for academic achievement and promotion to higher education and career opportunities. So, supporting students facing academic challenges through individualized or group counselling and intervention services is central to students' academic prosperity. Research has indicated that students' self belies about academic is one of the primary determinants affecting their academic performance (Burger & Naudé, 2019; Iyengar et al., 2021; Marsh et al., 1988; Shavelson et al., 1976; van der Aar et al., 2019). The scenario calls for assessing and monitoring the student's academic beliefs and inclination to academic undertakings. Therefore, the present academic self-concept scale for assessing students' academic beliefs has potential educational implications. The study findings have answered the pressing question of whether Reynolds's academic self-concept scale (1988) could be feasible for studying the secondary students' self-perceptions of their studies in Tanzania.

Limitations

The researcher used ordinary-level secondary school students of Mbeya City Council, Tanzania, to validate Reynolds's academic self-concept; therefore, it cannot be generalized to other levels of secondary schools. The study involved public secondary schools; the study could yield different results by using students from private and public secondary schools. Initially, the scale was developed for college students, but the present

study validates the scale using secondary school students, which might not adequately reflect the characteristics of the original scale, as some items were redundant for secondary school students.

Conclusion

The study aimed to validate the Reynolds academic self-concept measure among secondary school students in Mbeya City Council, Tanzania. The procedures for validating the scale led to the final model comprising four factors: grade and effort, study habits, satisfaction, and Self-confidence, making a total of 16 items. The statistical analysis in the present study established that the four-factor model acceptable the criteria for assessing secondary school students' academic self-concept. Therefore, the four extracted factors demonstrate characteristics for assessing the academic self-concept of secondary school students in Tanzania. However, the scale cannot fit all contexts as subjects differ in several factors, such as knowledge, culture, experiences, and attitude. The validated scale can be further validated in other contexts for scholarly advancement.

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Data Availability. The data pertaining this study are available upon request from the corresponding author.

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