

Gender in Relation to Academic Self-concept among Government Secondary School Students of Mbeya City Council, Tanzania

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ABSTRACT The study focused on the association between gender and academic self-concept (ASC) among secondary school students in Mbeya City Council, Tanzania. The study employed a cross-sectional survey design in which 218 *Form Three* students were randomly selected to participate in the study. The study used the ASC scale developed by William M. Reynolds (1988), consisting of 40 items. The Statistical Package for Social Sciences version 26.0 was used for data analysis. The Mann-Whitney test showed that students differed significantly by gender in ASC; ($N=218$, $U=4682.00$, $Z=-2.230$, $p=.026$). Male students ranked higher than females (*Mean Rank*=121.18 and 101.74, respectively). The Spearman's rho correlation test indicated a weak negative association between gender and ASC ($r=-.151$, $p=.03$). Ordinal Logistic Regression showed a significant association between gender and ASC ($B=.53$, $S.E=.24$, Wald $X^2(1)=4.88$, $p=.03$; $EXP(B)=1.70$). The gender difference in ASC among students was evident. The areas for policy attention have been suggested.

INTRODUCTION

Academic self-concept (ASC) is an individual's perception of their performance ability and accomplishment in particular academic domains (Shavelson et al. 1976; Marsh and Shavelson 1985; Brunner et al. 2010). Chen et al. (2021) and Perinelli et al. (2022) posit that students evaluate their academic ability, through which they develop academic self-perception, affecting their educational and career pathways. In ASC, students evaluate their academic potential so they can select subjects, devote time and resources to them, and ultimately influence their educational and professional goals (Mafarja and Zulnaidi 2022). Mafarja and Zulnaidi highlight that teaching and learning approaches that engage learners significantly contribute to the development of positive ASC. Also, Guo et al. (2022) view positive ASC as an outcome of student interactions in a conducive learning environment. In pursuing education, ASC is like a signpost which

orientates students to different academic domains for academic achievement and career aspirations (Yu 2020; Hansen et al. 2023).

Moreover, Haktanir et al. (2018) and Lubawa et al. (2021) describe ASC as a psychological characteristic underlying students' schooling, engagement in academic responsibilities, and educational outcomes. Essentially, ASC motivates individuals' educational outcomes, social identification, and roles (Verhoeven et al. 2019; Choy and Yeung 2022). As students come from diverse sociocultural environments; thus, psychological intervention is imperative to promote psychological well-being for developing positive ASC (Yibeltal 2020; van der Westhuizen et al. 2022).

Nevertheless, development of ASC is inseparable from environmental factors, including family background, peer groups, significant others, and school environments, from which an individual establishes self-perceptions about academic disciplines (Marsh and Shavelson 1985; Becker and Neumann 2016; Dicke et al. 2018; Covarrubias et al. 2020; Marsh et al. 2021). It has been observed that the student's family's social, economic, and cultural backgrounds have a significant impact on

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their ASC in various academic disciplines (Korhonen et al. 2016; Trautwein and Möller 2016; Fleischmann et al. 2023). The student-environment interactions create a baseline for the development and adjustment of their ASC.

Regarding gender and academic self-concept, various studies have been conducted and revealed varying results. For example, Lohbeck et al. (2017) conducted a study with primary school students in German and revealed no significant difference in ASC between male and female students. In the same study, male students clearly described and evaluated their academic performance based on their academic ability, unlike female students. Lohbeck and colleagues stress the importance of creating conducive school teaching and learning environments for promoting ASC. Similarly, the study by Goni and Bello (2016) in Borno State, Nigeria, revealed no significant difference in ASC between male and female college students. However, Goni and Bello found that students' academic performance differed according to the family's socioeconomic situation. In addition, Goni and Bello clarify that educated, resourceful, and supportive families instil positive ASC in their children. Students from weak socioeconomic situations are more vulnerable to negative ASC and poor academic performance (Rüschepöhler and Markic 2020a, b). Besides family background, a review of literature by Wang et al. (2020) found that sociocultural constructions perpetuate the gender gap in educational settings, where female students are often victimized.

Furthermore, Grygiel et al. (2017) report that primary school pupils in Poland demonstrated a substantial difference in ASC by gender; boys ranked higher than girls. Grygiel and colleagues also found an inverse relationship between ASC and class level. Huang (2013) as well found that ASC changed according to age and varied across gender due to exposure to academic experiences. Huang also found that social and cultural practices induced academic stereotyping, leading to anxiety and negative perceptions about various academic domains. In addition, Rossi et al. (2022) point out that low ASC and academic performance among female students, especially in mathematics were caused by a lack of academic support from teachers, other students and unfriendly teaching and learning strategies. Likewise, the study by Forgasz and Leder (2020) found that male students

demonstrated higher mean academic scores than female students in single-sex schools. It appears that grouping students according to their gender impacts the school atmosphere for the development of ASC. Other studies have revealed that interest, motivation, and prior academic success contribute to variation in ASC among students (Simpson et al. 2016; Vu et al. 2022). In the study by Korhonen et al. (2016) with Swedish high school students, boys were motivated by their mathematics accomplishments, whilst girls were pushed by their reading achievement. The study's findings showed that interest in the said academic domains affected their ASC and educational prospects.

Moreover, a study by Buhl-Wiggers et al. (2021) on academic performance in primary school students in East Africa found a considerable difference in academic performance between boys and girls. Buhl-Wiggers and colleagues also found that social, cultural, and geographic location contribute to differences in academic performance by gender. Makwinya and Hofman (2015) conducted a study on gender differences in science domains among secondary school students in Tanzania. The study revealed that males slightly ranked higher than females in perceptions of science subjects. Makwinya and Hofman assert that gender-based perceptions of academic disciplines pervade gender disparities in students' expectations for their education and careers. Other recent studies in Tanzania also revealed gender discrepancies in academic undertakings. For example, Amani (2022) conducted a quantitative study with standard seven primary school pupils. The study found that few female students positively perceived Science, Engineering, Technology and Mathematics (STEM)-related jobs. According to Amani, social and cultural factors impact academic perceptions and career aspirations. In the same geographical region, a qualitative study by Fussy et al. (2023) with secondary school students found that cultural practices induce negative perceptions of female students about science subjects and their related career opportunities. Importantly, Fussy and colleagues revealed an overburden to female students compared to male students in the distribution of home responsibilities hence the gender gap in academic domains.

On the contrary, Ndijuye and Beatus (2022) found that female students surpassed male pupils academically among rural and urban elementary

schools in Tanzania. According to Ndijuye and Beatus, limited teaching and learning resources and low parental support, among other factors, lessened children's interest and motivation for schooling. In addition, Mazana et al. (2020) and Kyaruzi (2023) claim that female students' under-performance in Mathematics among Tanzanian secondary school students is associated with gender-based perceptions of subjects hence distortion of their ASC.

Regarding young individuals' educational and career expectations, Sinclair et al. (2019) and Cuthbert et al. (2023) argue that the gender gap in academic domains perpetuates professional and employment disparity among adolescents. Korhonen et al. (2016) further clarify that the student's perceived academic performance in various subjects during schooling contributes to perceived gender-based educational and career aspirations. As a response to the stated situation, it has been suggested that teachers, counsellors, and parents to identify, encourage, and support academically challenged students to develop positive ASC (Szumski and Karwowski 2015, 2019; Lavy and Naama-Ghanayim 2020; Haktanir et al. 2021).

In sum, the surveyed studies indicate that ASC is crucial to assisting students in realizing their academic and career goals, identity formation, and academic engagement. Although studies have consistently shown gender variations in academic pursuits, little is known about how gender relates to ASC among students in Tanzania's government secondary schools in the Mbeya City Council.

Significance of the Study

Certainly, ASC is an essential psychological dimension for students' proper academic achievement and determination of career goals. Several studies have pointed out that ASC keeps students focused and motivated towards their academic achievement and career aspirations (Jusoh et al. 2021; Zaini et al. 2021; Fleischmann et al. 2023). Febriana et al. (2020) and Carrillo-López et al. (2022) view ASC as a building block for education advancement, career choice, and development. Also, studies have shown that earlier developed ASC affects successive education and career perceptions, impacting a person's future education and career directions (Hansen and Henderson 2019). In this regard, Perinelli et al. (2022) and Alkhateeb

et al. (2022) conclude that assisting students in developing positive ASC is imperative for meaningful learning. The authors add that early assistance to students' academic problems guarantees desirable educational outcomes. Therefore, the present study's findings would contribute to the existing knowledge about the variation of ASC by gender and the association between gender and ASC among secondary students. Also, the study findings would be suggestive to educators, school counsellors and policymakers to design intervention strategies.

Objectives

1. To find out the extent of ASC among secondary school students of Mbeya City Council, Tanzania
2. To examine the association between gender and ASC among secondary school students of Mbeya City Council, Tanzania.

From the literature review, the researchers hypothesized that:

Hypothesis 1: The secondary school students differ significantly in ASC by gender.

Hypothesis 2: A significant relationship exists between gender and ASC among secondary school students.

MATERIAL AND METHODS

Participants

In examining the association between gender and students' ASC, the study employed a cross-sectional survey design. Through systematic random sampling, 218 *Form Three* students were selected to participate in the study from 12 purposefully selected government secondary schools in Mbeya City Council, Tanzania. The sample comprised 87 (39.9%) males and 131 (60.1%) females. Most respondents ranged from 14 to 16 years, amounting to 216 (99.1%) ($M=15, Mdn=15, SD=.245$).

Instruments

The researchers used Reynolds's (1988) ASC Scale, consisting of 40 items. Initially, the scale was developed for college students. So, the researcher reworded some scale items to fit the con-

text of secondary school students. Also, the scale’s four levels (from “1-Strongly Disagree” to “4-Strongly Agree”) were changed to five levels (from “1-Strongly Disagree” to “5-Strongly Agree”) by adding an undecided to give the respondents freedom of choice and expression of their perceptions about ASC. Before data analysis, the negatively worded items (4, 5, 11, 19, 22, 2, 34, 39, and 40) were reverse-coded. The scale showed adequate reliability at Cronbach’s Alpha ($\alpha=.92$). Data concerning gender was self-reported by the respondents. The researchers used Statistical Package for Social Sciences (SPSS) version 26.0 for data analysis.

RESULTS

The present study’s Shapiro-Wilk test for normal data distribution showed significant results ($p<.05$), skewness = -1.452, and kurtosis = 1.575). Also, Likert Scale was used for data collection; hence the data were ordinal. The two conditions indicate an asymmetrical data distribution, necessitating the researchers to employ a non-parametric test. Therefore, the statistical tests included the Mann-Whitney U Test to test the difference in ASC among students by gender, Spearman’s rho correlation, and ordinal logistic regression to test the variables’ associations. For meaningful interpretation of the Likert scale, the researchers computed the scale range values for ASC Scale as 1-Strongly Disagree (1-1.80), 2-Disagree (1.81-2.60), 3-Undecided (2.61-3.40), 4-Agree (3.41-4.20) and 5-Strongly Agree (4.21-5.00). The scale ranges were grouped as 1-1.80 and 1.81-2.60=“Low”, 2.61-3.40=“Moderate”, 3.41-4.20 and 4.21-5.00=“High”. The descriptive data analysis showed moderate ASC among secondary school students ($Mdn = 3.36$).

Test of Hypotheses of the Study

From the literature, two hypotheses were proposed and statistically tested as follows:

Table 2: Hypothesis test summary

	<i>Null hypothesis</i>	<i>Test</i>	<i>Sig.</i>	<i>Decision</i>
1	The distribution of ASC is the same across gender categories of GENDER	Independent-Samples Mann-Whitney U Test	.026	Reject the null hypothesis-

Asymptotic significances are displayed. The significance level is .050.
 Source: Field data 2023

Hypothesis 1: The secondary school students differ significantly in ASC by gender

The Mann-Whitney U test was used to evaluate the stated hypothesis, in which the statistical test revealed statistically significant differences in the ASC among students by gender ($N = 218$, $U = 4682.00$, $Z = -2.230$, $p = .026$, $r = -.151$). Table 1 summarizes the mean ranks whereby male students ranked higher than female students in ASC ($Mean Rank = 121.18$ and 101.74 , respectively).

Table 1: Mann-Whitney test

	<i>Gender</i>	<i>Ranks</i>		
		<i>N</i>	<i>Mean rank</i>	<i>Sum of ranks</i>
ASC	Male	87	121.18	10543.00
	Female	131	101.74	13328.00
	Total	218		

Source: Field data 2023

Table 2 summarizes the test of the proposed hypothesis that secondary school students differ significantly in ASC by gender. According to the statistical test, the proposed hypothesis was supported.

Hypothesis 2: A significant relationship exists between gender and ASC among secondary school students

The study used Spearman’s rho correlation to assess the relationship among variables under study. The statistical test indicated a significant negative correlation between gender and ASC ($r = -.151^*$, $p = .025$) (Table 3). The test result implies a weak significant correlation between gender and ASC.

Furthermore, ordinal logistic regression was carried out to investigate the association between gender and ASC. Table 4 depicts the statistical test whereby gender was found to significantly predict ASC ($B = .53$, $S.E = .24$, $Wald X^2(1) = 4.88$, $p = .03$; $EXP(B) = 1.70$). In regression analysis, gender was

Table 3: A correlation between gender and ASC

<i>Correlations</i>				1	2	3
Spearman's rho	1.	Gender	Correlation Coefficient	1.000		
		Sig. (2-tailed)				
	2.	Age	Correlation Coefficient	-0.098	1.00	
		Sig. (2-tailed)		0.150		
	3.	ASC	Correlation Coefficient	-.151*	0.043	1.00
		Sig. (2-tailed)		0.025	0.528	
		N		218	218	218

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Field data 2023

Table 4: Ordinal logistic regression

<i>Parameter estimates</i>											
<i>Parameter</i>		<i>95% Wald Confidence Interval</i>				<i>Hypothesis Test</i>			<i>95% Wald Confidence Interval for Exp (B)</i>		
		<i>B</i>	<i>Std. Error</i>	<i>Lower</i>	<i>Upper</i>	<i>Chi-square</i>	<i>df</i>	<i>Sig.</i>	<i>(B)</i>	<i>Lower</i>	<i>Upper</i>
Threshold	[ASC=1]	-4.50	0.71	-5.90	-3.10	39.67	1	0.00	0.01	0.00	0.05
	[ASC=2]	-1.75	0.22	-2.19	-1.31	60.79	1	0.00	0.17	0.11	0.27
	[ASC=3]	0.84	0.18	0.49	1.18	22.18	1	0.00	2.31	1.63	3.27
	[ASC=4]	5.62	1.01	3.65	7.60	31.06	1	0.00	276.82	38.31	2000.26
[Gender=0]		0.53	0.24	0.06	1.00	4.88	1	0.03	1.70	1.06	2.71
[Gender=1]		0 ^a							1.00		
(Scale)		1 ^b									

Dependent Variable: ASCModel: (Threshold), GENDER (0=Male, 1=Female)

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

Source: Field data 2023

positively associated with ASC, with odds ratio of 1.70, signifying that male students' odds for high ASC are 1.70 times higher than female students. Therefore, the proposed hypothesis was supported.

DISCUSSION

The study focused on examining the association between gender and ASC among government secondary school students in Mbeya City Council, Tanzania. The descriptive data analysis showed that students have an average ASC ($Mdn = 3.36$). The average ASC suggests that students are likely to accomplish academically at a level that jeopardizes their long-term educational and professional ambitions. Several studies have reported the significant role of ASC in academic success and career trajectory (Mafarja and Zulnaidi 2022; Yu 2020; Hansen et al. 2023). Likewise, Febriana et al. (2020) emphasize that positive ASC is essential for stu-

dents' academic achievement and preparation for future socioeconomic responsibilities. The average ASC in the current study may be attributed to academic limiting factors such as, but not limited to, school environment, teaching and learning approaches used by teachers, family socioeconomic background, and cultural practises as identified by other studies (Yibeltal 2020; van der Westhuizen et al. 2022). According to the study findings, the average ASC among secondary school students calls for interventional attention to assist students in proper progression in educational and career paths, as suggested by Korhonen et al. (2016); Trautwein and Möller (2016), and Fleischmann et al. (2023).

In addition, the study findings on the first hypothesis showed that male students ranked higher ($Mean Rank = 121.18$) than female students ($Mean Rank = 101.74$) in ASC. The findings are consistent with the study by Grygiel (2016), which found a significant difference in ASC among primary school

students in Poland by gender, whereby boys ranked higher than girls. However, the findings contradict Goni and Bello (2016) and Lohbeck et al. (2017), who found no significant difference in ASC among students by gender. This makes it clear that female students fall behind in the ASC, affecting their focus on academics and future careers. In this case, support from the government, parents, teachers, school counsellors, and other education stakeholders is central to promoting ASC among students.

Moreover, the second hypothesis tested the association between gender and ASC among secondary school students. According to Spearman's rho correlational analysis, gender significantly correlated with ASC ($r = -.151^*$, $p = .025$). Also, a further statistical test for the association between gender and ASC was conducted using ordinal logistic regression. The statistical test showed a significant association between gender and ASC ($B = .53$, $SE = .24$, $WaldX^2(1) = 4.88$, $p = .03$; $EXP(B) = 1.70$). According to the statistical test, gender significantly predicts the student's ASC. Also, findings show that the odds for high ASC among male students is 1.70 times higher than their counterparts, female students. The findings concur with Rossi et al. (2022) and Korhonen et al. (2016), who found that male students demonstrated higher ASC than female students, which relatively affected their academic performance. Also, the study's findings are consistent with the major conclusions of other studies, which found that cultural practices can lead to gender-based stereotypes in academic domains (Makwinya and Hofman 2015; Amani 2022; Fussy et al. 2023). The practices can lead to students' negative ASC in subjects like science, technology, engineering, and mathematics. Undoubtedly, ASC is fundamental for students' preparation to participate in socioeconomic development. The differences in ASC among students signify an anticipated imbalance in educational institutions, recruitment in various career opportunities and marginalization of female individuals in the socioeconomic arena.

Educational Implication

Studies have demonstrated that ASC is a crucial component of instruction and learning in educational settings, allowing students to evaluate their aptitude in various academic fields. Students evaluate their academic potential and how their

future occupations match their chosen fields of study. However, gender differences in academic fields have been reported that male students surpass female students in STEM (Makwinya and Hofman 2015; Amani 2022; Kyaruzi 2023; Mazana 2020). According to the present study, male students rank higher than female students in ASC. The study findings show warning signs of gender divide in professional and educational fields. To foster positive ASC among students, educators, parents, and counsellors must foster supportive surroundings. Also, educational intervention is pertinent to enhance a balance in educational services and career opportunities among students. Of course, ASC is essential for student social identity development, academic success, the transition to higher education, and professional objectives.

CONCLUSION

The study examined the relationship between gender and ASC among government secondary school students of Mbeya City, Tanzania. The students demonstrated average ASC, a significant difference in ASC where males ranked higher than females. The study findings have revealed that gender significantly predicts ASC. The proposed hypotheses regarding the ASC were supported. Home and school environments, peers, and significant others play a significant role in developing and shaping students' perceptions of themselves and the world. Therefore, study findings suggest supporting students to develop and adjust their ASC for academic achievement and realizing educational and career goals.

RECOMMENDATIONS

Vast studies have pointed out that the ASC is essential for students learning for future educational and career trajectories. However, the present study's findings show that female students rank low in ASC, implying low academic performance. This situation is devastating in education. Therefore, the study recommends creating a conducive learning environment, including providing teaching and learning resources in schools, especially in STEM-related fields. Teachers and counsellors to devise career and academic awareness programs to enhance students' ASC. Also, launching a collaboration with employment agencies, parents, and

other education stakeholders to educate society on unwelcoming cultural practices instigating gender-based stereotypes regarding some academic domains among students.

LIMITATIONS

This study used a quantitative approach in which participants' perceptions about gender concerning ASC could not be captured. Therefore, employing a mixed approach may enrich findings concerning gender in relation to ASC. The study also addressed gender in relation to ASC; other criteria can be employed to investigate how they relate to the construct.

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DECLARATION OF COMPETING INTEREST

No conflict of interest was raised in conducting this study.

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ETHICAL APPROVAL STATEMENT

The authors conducted the study subject to approval from Mbeya Regional and District Council Educational Authorities. Also, the manuscript is the authors' original work, and neither has been previously published nor is currently being considered for publication elsewhere.

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