INFLUENCE OF SELF-CONCEPT ON ALGEBRAIC PROBLEM-SOLVING SKILLS OF SECONDARY SCHOOL STUDENTS IN SOKOTO STATE, NIGERIA

ELIZABETH JULIUS
Department of Science Education, Faculty of Education
Kebbi State University of Science and Technology Aliero, Nigeria
Corresponding author: mummybaffa2000@gmail.com

Abstract

Self-concept is the organized and dynamic system of learned beliefs, attitudes, and opinions that individuals hold about themselves. While existing literature explores self-concept in various domains, there is a relative lack of focus on its relationship with problem-solving skills, particularly in algebra. This study investigated the influence of self-concept on the algebraic problem-solving skills of secondary school students in Sokoto State, Nigeria. A quantitative research design was employed, with a sample of 377 students selected proportionally and randomly from the population of all senior secondary school students in Sokoto State. Two researcher-developed instruments were used: a questionnaire measuring self-concept and a test measuring problem-solving skills. These instruments, developed through concept analysis and literature review, were validated by subject matter experts. Lawshe's Content Validity Ratio (CVR) was used to determine instrument validity based on expert feedback. A Likert scale assessed respondents' perceptions of their self-concept, while a rubric assessed their problem-solving skills. Exploratory factor analysis and a Kaiser-Meyer-Olkin (KMO) value of .827 were obtained during the pilot study. Data were analyzed using SPSS version 22 and Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 3. Descriptive statistics were used to analyze each construct and the respondents' demographic characteristics. Inferential statistics, including path and structural analysis, were also employed. The results indicated a high level of self-concept across all dimensions, but no significant influence of these dimensions on students' algebraic problem-solving skills. Among the recommendations, the study suggests that the development of self-concept is largely influenced by significant others, such as parents and teacher role models. These influential figures can communicate to students that they possess the skills, capabilities, and temperament necessary for academic achievement.

Keywords: Algebra; Problem Solving Skills; Secondary School; Self-concept

DOI: https://doie.org/10.0302/SER.2025493599

Introduction

Self-concept refers to the organized and dynamic system of learned beliefs, attitudes, and opinions that individuals hold about themselves. An individual's behavior is often predicted by their beliefs, which influence how they utilize their skills, knowledge, and experiences (Kvedere, 2014). These beliefs naturally evolve from childhood to adulthood through environmental interaction (Erozkan, 2013). As children develop, their physiological, social, cognitive, emotional, and psychological aspects undergo significant changes, impacting their personality and behavior. Adolescents are particularly vulnerable to distorted self-image, making this developmental stage a crucial area of self-concept research (Cornella-Font et al., 2020). This study focuses on students' self-concept as their beliefs about themselves and their capabilities, specifically in relation to algebraic problem-solving skills. This focus is warranted because existing literature has not fully explored the relationship between self-concept and problem-solving skills, particularly in algebra.

Self-concept is a long-standing and significant construct in social science, defined in various ways by scholars across fields such as social psychology, personality, education, child development, mental and physical health, social service, organizational studies, industry, and sports (Marsh & Hau, 2004). Arslan (2021) highlighted the importance of self-concept and its connection to a sense of belonging. For example, Marsh et al. (2007) defined self-concept as "a person's self-perceptions and beliefs about themselves that are formed through experience with one's environment." Self-concept can also be viewed as an individual's self-perception, reflecting their feelings or confidence in accomplishing specific tasks (Awan, Noureen & Naz, 2011). According to Blanco et al. (2022), self-concept is a key variable within personality studies, related to self-acceptance and indicative of psychological satisfaction and well-being, contributing to health and mental balance from an affective and motivational perspective. In this study, self-concept is defined as the image students hold of themselves regarding their ability to solve algebraic problems.

The National Council of Teachers of Mathematics (2000) defined problem-solving as a process where students engage in finding solutions to unfamiliar tasks. Altun (2003) suggested that problem-solving skills involve the ability to identify a problem and take appropriate steps toward a solution. Furthermore, problem-solving is the process of applying mathematical skills and knowledge to new and unfamiliar situations to solve mathematical questions (Freitag, 2014). Problem-solving skill development involves acquiring knowledge about problem-solving and the ability to organize that knowledge for use in finding solutions (Altun, 2003). Problem-solving is a central part of mathematics, aiming not only to equip students with a set of skills and processes but also to enable independent thinking. Research suggests that problem-based learning is effective in developing problem-solving skills (Gunusen et al., 2014). For this study, problem-solving in algebra is defined as a learner's ability to use their mathematical knowledge to solve problems related to algebraic concepts. These skills are crucial for student success, as they need to construct their own understanding when solving problems rather than relying solely on memorized formulas or classroom instruction.

Algebra is considered a vital aspect of school mathematics, playing a significant role not only within mathematics itself but also as a gateway to future educational and employment opportunities (Silver, 1997). Students need algebra to develop the mathematical skills of problem-solving, communication, reasoning, and making connections necessary for daily life. This study focuses on problem-solving in algebra because research indicates that secondary school students in Nigeria struggle with algebraic problem-solving. WAEC reports suggest that these students rely heavily on classroom instruction and formula memorization, indicating a lack of independent problem-solving skills. Marsh et al. (2011) conducted a meta-analysis demonstrating a strong connection between self-concept and student achievement. Self-concept is not only a significant outcome construct but also plays a fundamental role in influencing other desirable educational outcomes. While self-concept has been shown to affect student achievement, this relationship needs further investigation among students in Sokoto, Nigeria, where self-concept research is limited. Several studies on self-concept have been reported, some of which are summarized below.

Kim & Choi (2014) found a significant relationship between professional self-concept and critical thinking disposition in improving problem-solving ability in a cross-sectional survey of 186 Korean nursing students. Kvedere (2014) explored mathematics

self-efficacy, self-concept, and anxiety among 9th-grade students in Latvia, finding that boys had more positive mathematical self-concept than girls, and students from larger cities had more negative self-concept than those from rural areas. Lundetrae et al. (2010) conducted a cross-cultural study on mathematical self-concept among young adults aged 16-24 in Norway, Canada, Italy, Switzerland, and the USA, finding that gender influenced mathematics self-concept in Switzerland and Norway, even when controlling for numeracy skills. This result aligns with the findings of Skaalvik & Skaalvik (2011).

However, Chirinda & Barmby (2018), in a study of teachers' views on teaching problem-solving, found that teachers' reliance on step-by-step instruction contributed to students' perceived lack of mastery of basic algorithms. The reviewed studies reveal a gap in the literature regarding the influence of self-concept on problem-solving skills among students in Sokoto, Nigeria. Therefore, this study aims to address this gap and investigate this relationship.

Theoretical framework

Carl Rogers, a prominent figure in humanistic psychology, developed the Theory of Personality Development, popularized in 1959. This theory centers on the concepts of self and self-concept, defining self-concept as an individual's perception of their own behavior, abilities, and unique characteristics. It posits that self-concept is an organized and consistent set of perceptions and beliefs about oneself. For example, beliefs such as "I am a good friend" or "I am a kind person" contribute to an individual's overall self-concept.

This theory emphasizes that every individual has the potential to achieve their highest level of success, given a supportive environment that fosters optimal functioning. This suggests that all students have the potential to solve mathematical problems in algebra, provided they have a conducive learning environment. These potentials are unique to each individual and develop differently depending on personality (Pajares & Miller, 1994). The theory identifies three key components of the self:

Self-worth: This refers to how individuals think about themselves. Rogers believed that feelings of self-worth develop in early childhood through interactions with the immediate environment (parents or school). It involves an evaluation of oneself, leading to either a positive or negative self-perception.
Self-image: This focuses on how people see themselves. A positive self-image is important for psychological well-being and can be influenced by physical appearance. Individuals may perceive themselves as good or bad, beautiful or ugly, etc.
Ideal self: This represents what a person aspires to become in the future. It encompasses life goals and aspirations and is distinctive and dynamic, meaning it is constantly evolving and may not always align with real-life experiences.

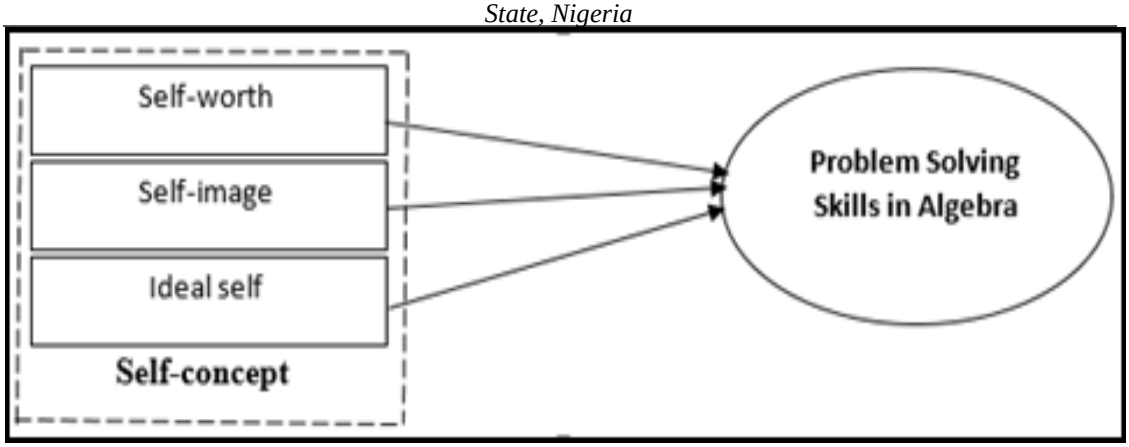

Figure 1. Conceptual model of the research

Research on the specific variables under consideration, particularly their relationship with students' algebraic problem-solving skills, is limited. While numerous studies have explored the relationship between self-concept and mathematics achievement, these studies often focus on general mathematics learning and are predominantly conducted in Western countries. In Nigeria, research in this area is still developing, leaving a significant gap in understanding. Therefore, this study is necessary to address this gap and contribute to the existing body of knowledge.

Research objectives

The objective of this study was to examine the level of self-concept and test the influence of self-concept on Algebraic problem-solving skills of secondary school students in Sokoto, Nigeria.

Research questions

What is the level of self-concept among secondary school students in Sokoto State?
To what extent does Self-concept influence problem-solving skills among secondary school students in Sokoto State?

Methodology

This section details the research procedures employed in this quantitative survey study, which explores the influence of secondary school students' self-concept on their algebraic problem-solving skills in selected secondary schools in Sokoto State, Nigeria. The study was conducted in eight selected secondary schools in Sokoto, Nigeria, among Senior Secondary Two (SSII) students, typically aged 15-17 years. The sample size of 377 participants was determined using Krejcie & Morgan's (1970) sample size table, which deemed 377 appropriate for a population of 21,839.

Instrumentation is crucial in research, as it provides the means for data collection. This study used a questionnaire to assess students' algebraic self-concept and a problem-solving skills test. Existing self-concept measures, such as the Rosenberg Self-Worth Scale (1979), the Richardson et al. Self-Image Scale (1984), and the NCTM Self-Esteem Scale (2000), were deemed unsuitable for secondary school students in Sokoto due to cultural, environmental, and locational differences.

Therefore, it was necessary to develop a context-appropriate algebraic self-concept scale and problem-solving skills test. A concept analysis was conducted to define the construct of algebraic self-concept and its constituent elements, facilitating item generation. This was complemented by a literature review to gather further information on the construct. Based on the concept analysis and literature review, items were developed for the algebraic self-concept scale. Subject matter experts (SMEs) validated the instrument, and their feedback was analyzed using Lawshe's (1975) Content Validity Ratio (CVR). The instrument was then revised, with some items being removed. The final algebraic self-concept scale used a five-point Likert scale.

The problem-solving performance test, consisting of ten items reflecting the secondary school syllabus and based on secondary school mathematics textbooks and WAEC past questions, was used to measure students' problem-solving skills. A three-point rubric was used for assessment: 1 (completely incorrect), 2 (partially correct but incorrect), and 3 (completely correct). Each item had a difficulty index between 0.27 and 0.54. According to Loon (2007), a difficulty index between 0.20 and 0.80 is acceptable for test item inclusion. All items demonstrated a positive discrimination index between 0.21 and 0.37. An item with a discrimination index above 0.25 is considered good (Khan et al., 2015).

While a reliability coefficient greater than 0.70 is generally desired, values as low as 0.50 are acceptable for exploratory studies using newly developed instruments (Field, 2005). A well-constructed scale may have a reliability coefficient between 0.80 and 0.90 (Black, 1999; Mertens, 1998). Given that the algebraic self-concept instrument and the problem-solving skills test were newly developed for the specific context of Sokoto, Nigeria, their reliability was assessed using Cronbach's alpha. The algebraic self-concept instrument achieved a reliability of .879, and the problem-solving skills test, .684.

SPSS version 22 was used to analyze the collected data and assess the reliability of the self-concept instrument's dimensions. Exploratory factor analysis was employed to evaluate factor loadings and KMO validity. Inferential analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM), a multivariate statistical technique used to examine direct and indirect relationships between latent variables (Gefen et al., 2000).

Table 1. Items distribution after verification by experts

Construct	**Dimension**	**Number of Items**	**Total number of Items Retained**
Self-concept	Self-worth	8	2 items revised/1 item eliminated
	Self-image	8	1 item revised
	Ideal self	8	1 item eliminated
Problem Solving Skills		10	5 items eliminated

However, exploratory factor analysis was conducted to further test the reliability and validity of the constructs of the algebraic Self-concept and Problem-solving skills test. Exploratory factor analysis

Exploratory factor analysis (EFA) is a common approach used in factor analysis to examine the individual influence of each item within a construct (Hair et al., 2006; Hair et al., 2014). As Awang (2014) suggests, EFA is appropriate for analyzing items developed by the researcher or derived from existing literature. In this study, EFA was used to determine the dimensionality of the items and to remove items with low factor loadings or redundancy. A total of 18 items were retained for the self-concept construct, and 5 items were retained for the problem-solving skills assessment. All items with factor loadings below 0.5 were removed. These results are presented in Table 2.

Table 2. Exploratory factor analysis loading for self-concept

Item	**Factor Loading**			
	Factor 1	**Factor 2**	**Factor 3**	**Facto 4**
SW1		.553		
SW2		.695		
SW3		.785		
SW4		.825		
SW5		.831		
SW6		.847		
SW7		.732		
SI1			.753	
SI2			.828	
SI4			.817	
SI5			.865	
SI6			.785	
SI7			.828	
IS1				.836
IS3				.797
IS4				.883
IS5				.834
IS6				.789
PSS1	.885			
PSS2	.935			
PSS6	.968			
PSS7	.906			
PSS9	.970			

Item validity analysis

Validity is a measure that indicates the degree to which an instrument is measuring what it is expected to measure Hair et al., (2010). It aims at ensuring that the items used are really valid. The validity of the items was further tested using Bartlett's test. Kaiser-Meyer-Okin (KMO) variable values are usually not supposed to be less than .60. KMO and the values calculated for this research is .827 therefore items met the criteria and were valid to be used as shown in Table 3.

Table 3: KMO bartlett's for self-concept

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.827
Bartlett's Test of Sphericity	Approx. Chi-Square	4929.928
	Df	231
	Sig.	.000

Table 4: Cronbach alpha values for self-concept dimensions and problem-solving skills

Self-concept Dimensions	Mean	SD	Cronbach Alpha Value
Self-image	3.41	.52	.884
Self-worth	3.44	.47	.783
Ideal self	3.30	.61	.732
Problem Solving Skills	4.27	.36	.684

Result

The results of the study were reported based on the research questions.

Research question 1: what is the level of students' Self-concept?

Table 5: Mean, SD and level of each of the self-concept dimension

Self-concept Dimensions	Mean	SD	Level
Self-image	3.41	.52	High
Self-worth	3.44	.47	High
Ideal self	3.30	.61	High

Based on table 5 above, the results of the findings showed that all dimensions are at a high level. This implies that secondary school students in Sokoto state have a high level of self-concept.

Research question 2: To what extent does self-concept influence Problem-solving skills among secondary school students in Sokoto state?

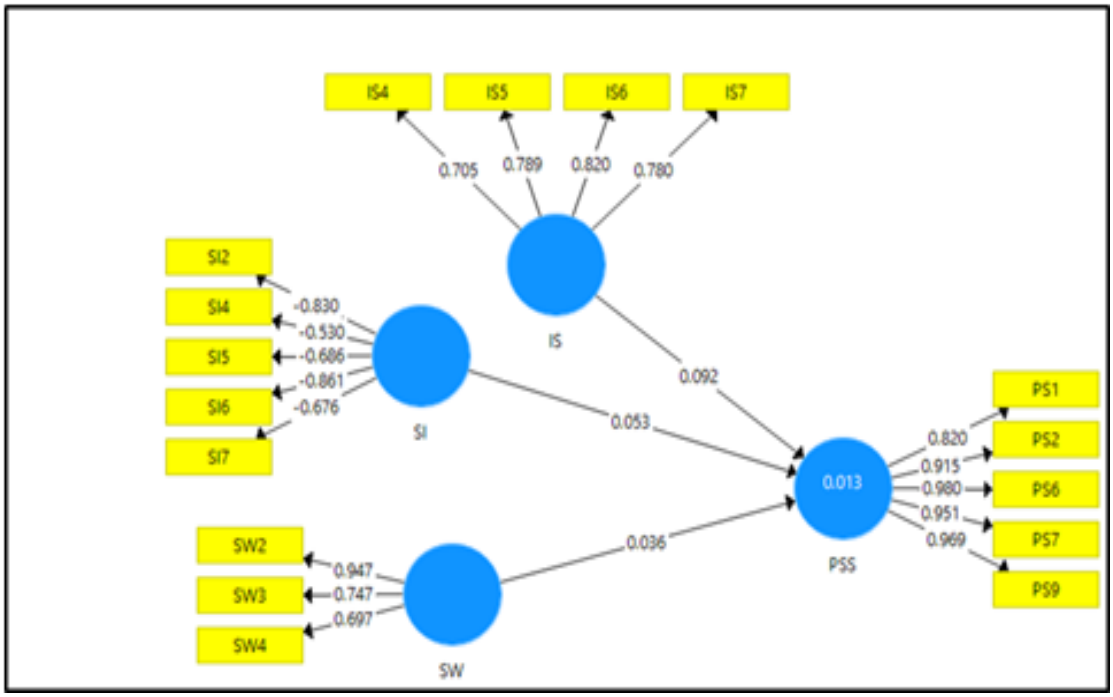

Figure 2: Path coefficient of self-concept on problem solving skills

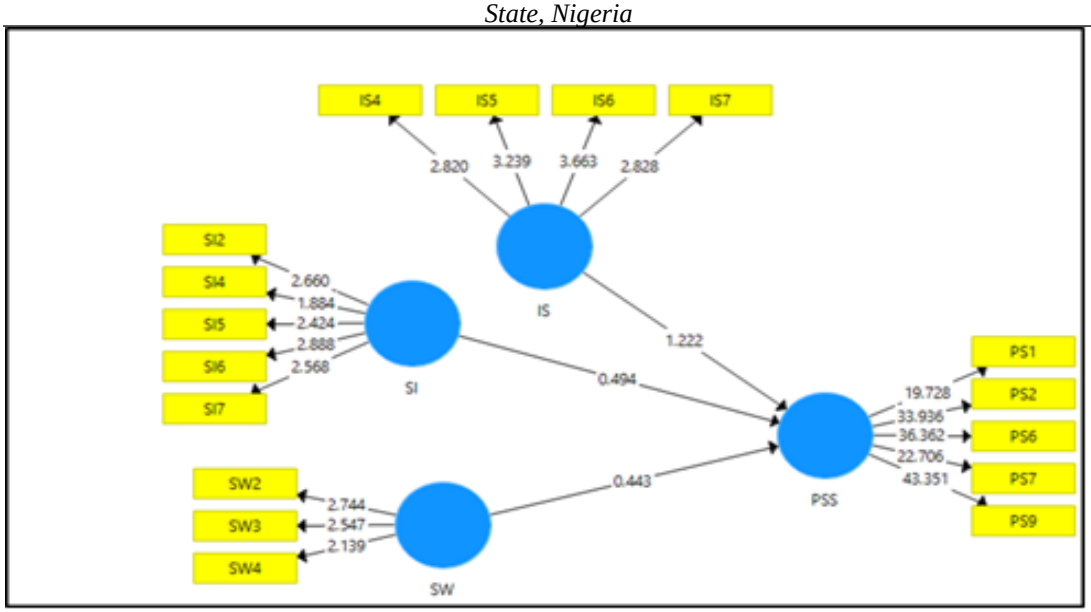

Figure 3: Structural model of self-concept and problem-solving skills in algebra

Table 6. T-statistics and P-value of self-concept on problem solving skills

	Original Sample (O)	Sample Me(M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
IS -> PSS	0.0922	0.0990	0.0749	1.2316	0.2187
SI -> PSS	0.0525	0.0188	0.1050	0.5005	0.6169
SW -> PSS	0.0363	0.0110	0.0800	0.4539	0.6501

The path analysis revealed that none of the dimensions of students' algebraic self-concept had a significant influence on their problem-solving skills. The path coefficients were 0.092, 0.053, and 0.036, with t-values below the significance threshold of ±1.96. Byrne (2010) states that a significant influence between dependent and independent variables requires a t-value of at least ±1.96 and a p-value of 0.05 or less. In this case, because the t-values were all below ±1.96, the influence of students' algebraic self-concept on their problem-solving skills is not statistically significant, indicating that the dimensions of self-concept do not appear to affect problem-solving skills.

Discussion

This study investigated the level of students' algebraic self-concept and its influence on their problem-solving skills. The findings revealed a significantly high level of self-concept across all dimensions (self-worth, self-image, and ideal self). This contrasts with Morony et al.'s (2013) findings of low self-concept and high math anxiety among Asian students, and also differs from Jameson & Fusco's (2014) findings of lower self-concept and higher math anxiety in adult learners compared to traditional students. These discrepancies are likely attributable to variations in location, culture, and religious or belief systems, as cultural and environmental factors significantly influence self-concept (Rogers, 1959).

Furthermore, this study found no significant relationship between self-concept and students' algebraic problem-solving skills, suggesting that self-concept does not directly

affect these skills. Observations indicated that many students disliked solving algebraic problems. Some attempted solutions but did not complete them, even when encouraged. Those who did provide solutions often struggled to explain or justify their answers. It was noted that secondary school students in Sokoto often struggle with problems involving the substitution of letters for numbers and word problems, frequently becoming confused, unmotivated, and disengaged. This finding contradicts Kim & Choi's (2014) finding that students with high self-concept possess strong problem-solving skills. It also differs from Chiu & Klassen's (2010) study, which found a strong influence of self-concept on academic achievement, and Ayodele's (2012) research in Nigeria, which reported a moderate correlation between self-concept and mathematics performance. Thus, the present study's findings diverge from several previous studies.

Conclusion

Existing literature reveals a research gap regarding the influence of self-concept on algebraic problem-solving skills. This study explored the relationship between self-concept and algebraic problem-solving skills among senior secondary school students. The results indicate that a high level of self-concept does not necessarily translate to improved problem-solving skills in algebra. Therefore, it is recommended that inter- and intra-school competitions focusing on algebraic problem-solving be encouraged to enhance students' abilities in this area.

Recommendations

Based of the findings of the study, the following recommendations were put forward

1. Self-concept development is significantly influenced by key figures such as parents and teacher role models. These individuals should communicate to students that they are perceived as possessing the skills, capabilities, and temperament necessary for academic success.
2. Collaboration between counseling psychologists (school counselors) and mathematics teachers in the affective domain is essential. This should involve developing preventative and interventional projects and programs to address difficulties in algebraic problem-solving and mathematics learning in general. The goal is to foster interest in solving algebraic problems and improve students' psychological experience when engaging with mathematical problems.
3. The Sokoto State Government and the Ministry of Education should prioritize mathematics teacher education by regularly organizing workshops, seminars, and refresher courses for practicing mathematics teachers. This will equip them with strategies for integrating, inculcating, and boosting students' self-concept in mathematics instruction, ultimately improving algebraic problem-solving skills.
4. Mathematics teachers should recognize the importance of students' self-concept as a significant psychosocial factor in mathematics education.
5. Schools, in collaboration with the Ministry of Education (MoE), should organize inter- and intra-school mathematics competitions focusing on algebraic problem-solving skills. This will build students' confidence in independently tackling assigned tasks.

References

Awan, R. N., Noureen, G., & Naz, A. (2011). A study of relationship between achievement motivation, self-concept and achievement in English and mathematics at secondary level. *International Education Studies,* **4** (3): 72–79.

Awang, Z. (2014). *A handbook on structural equation modelling.* MPWS Rch Publication.

Ayodele, O. J. (2012). Self-concept and performance of secondary school students in mathematics. *Journal of Educational and Developmental Psychology,* **1** (1): 176–183. https://doi.org/10.5539/jedp.v1n1p176

Altun, H. (2003). The perceived problem-solving ability and values of student nurses and midwives. *Nurse Education Today,* **23**: 575–584.

Arslan, E. (2021). Investigation of pre-school children's self-concept in terms of emotion regulation skill, behavior, and emotional status. *Anales de Psicología, 37,* 508–515. https://doi.org/[CrossRef]

Black, T. (1999). *Doing quantitative research in the social sciences: An integrated approach to research design, measurement, and statistics.* Sage.

Blanco, J. R., Ornelas, M., Barrón-Luján, J. C., Franco-Gallegos, L. I., Aguirre, S. I., Blanco, H., Zueck, M. d. C., & Jurado-García, P. J. (2022). Factor structure of the AUDIM-M dimensional self-concept questionnaire in Mexican adolescents. *Children,* **9** (60). https://doi.org/10.3390/children9010060

Byrne, B. M. (2010). *Structural equation modelling with AMOS: Basic concept application and programming.* Psychology Press.

Chiu, M. M., & Klassen, R. M. (2010). Relations of mathematics self-concept and its calibration with mathematics achievement: Cultural differences among fifteen-year-olds in 34 countries. *Learning and Instruction,* **20**: 2–17. https://doi.org/10.1016/j.learninstruc.2008.11.002

Chirinda, B., & Barmby, P. (2018). South African grade 9 mathematics teachers' views on the teaching of problem-solving. *African Journal of Research in Mathematics, Science and Technology Education*, 1–11. https://doi.org/10.1080/18117295.2018.1438231

Cornellà-Font, M. G., Viñas-Poch, F., Juárez-López, J. R., & Malo-Cerrato, S. (2020). Risk of addiction: Its prevalence in adolescence and its relationship with security of attachment and self-concept. *Clínica Salud,* **31**: 21–25. https://doi.org/[CrossRef]

Erozkan, A. (2013). The effect of communication skills and interpersonal problem-solving skills on social self-efficacy. *Educational Science: Theory and Practice,* **13** (2): 739–745.

Freitag, M. A. (2014). *Mathematics for elementary school teachers: A process approach.* Brooks/Cole, Cengage Learning.

Field, A. (2005). *Discovering statistics using SPSS for Windows* (2nd ed.). Sage.

Gefen, D., Straub, D. W., & Boudreau, M. C. (2000). Structural equation modelling and regression: Guidelines for research practice. *Communication of the Association for Information Systems,* **4** (7): 2–77.

Gunusen, N. P., Sercekus, P., & Edeer, A. D. (2014). A comparison of problem-based and traditional education on nursing students' locus of control and problem-solving skills. *International Journal of Nurses Knowledge,* **23**.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis.* Prentice Hall.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Pearson Prentice Hall.

Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM). *European Business Review*, **26**: 106–121.

Jameson, M. M., & Fusco, B. R. (2014). Math anxiety, math self-concept, and math self-efficacy in adult learners compared to traditional undergraduate students. *Adult Education Quarterly*, **64** (4): 306–322. https://doi.org/10.1177/0741713614541461

Kvedere, L. (2014). Mathematics self-efficacy, self-concept, and anxiety among 9th grade students in Latvia. *Procedia - Social and Behavioral Sciences*, **116**: 2687–2690. https://doi.org/10.1016/j.sbspro.2014.01.636

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement.*

Kim, K., & Choi, J. (2014). The relationship between problem-solving ability, professional self-concept, and critical thinking disposition of nursing students. *International Journal of Bio-Science and Bio-Technology*, **6** (5): 131–142.

Khan, G. N., Ishrat, N., & Khan, A. Q. (2015). Using item analysis on essay-type questions given in summative examination of medical college students: Facility value, discrimination index. *International Journal of Research in Medical Sciences*, **3** (1): 178–182. https://doi.org/10.5455/2320-6012.ijrms20150131

Skaalvik, E. N., & Skaalvik, S. (2011). Self-concept and self-efficacy in mathematics: Relation with mathematics motivation and achievement. *Journal of Educational Research*, **5** (3/4): 241–264.

Lawshe, C. H. (1975). A quantitative approach to content validity. *Personnel Psychology*, **28**: 563–575.

Mertens, D. (1998). *Research methods in education and psychology: Integrating diversity with quantitative and qualitative approaches.* Sage.

National Council of Teachers of Mathematics. (2000). *Principles and standards for teaching school mathematics.*

Pajares, F., & Miller, M. D. (1994). Role of self-efficacy and self-concept beliefs in mathematical problem solving: A path analysis. *Journal of Educational Psychology*, **86**: 193–203.

Rosenberg, M. (1979). *Conceiving the self.* Basic Books.

Richardson, R. A., Galambos, N. L., Schulenberg, J. E., & Petersen, A. C. (1984). Young adolescents' perceptions of the family environment. *Journal of Early Adolescence*, **4**: 131–154.

Reyes, L. H. (1984). Affective variables and mathematics education. *The Elementary School Journal*, **84** (5): 558–587.

West African Examination Council. (2013–2015). *Chief examiners' reports.*

Whiston, S. C. (2012). *Principles and application of assessment in counselling.* Cengage Learning.

Wondimu, A., Alexander, M., Hans, K., & van der W. G. (2012). Reciprocal relationships between math self-concept and math anxiety. *Learning and Individual Differences*, **22** (3): 385–389.