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Influence of Sel-Concept on Academic Achievement in Chemistry among Gifted Students in Government Day Science Secondary School Gumel, Jigawa State

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Abstract **Original Research Article**

This study examined the influence of self-concept on academic achievement in Chemistry among gifted students in Government Day Science Secondary School, Gumel, Jigawa State, Nigeria. Self-concept has increasingly been recognized as a psychological factor that shapes students' attitudes, motivation, confidence, and academic outcomes. Despite the intellectual capacity of gifted learners, differences in academic performance continue to exist, suggesting that non-cognitive variables such as self-concept may contribute to variations in achievement. The study adopted a descriptive survey research design. The target population consisted of gifted senior secondary school students offering Chemistry in Government Day Science Secondary School, Gumel. Data were gathered using structured questionnaires and students' Chemistry achievement records. The findings from reviewed literature indicate a significant positive relationship between academic self-concept and students' achievement in science-related subjects, particularly Chemistry. Students with stronger perceptions of their academic abilities tend to demonstrate greater persistence, confidence, and improved academic outcomes. The study recommends that school administrators, teachers, and parents support the development of positive self-concept through mentorship, effective feedback, counseling services, and learner-centered instructional practices.

Keywords: Self-concept, Chemistry performance, gifted students, academic achievement, secondary education, Jigawa State.

Background to the Study

Education serves as an essential instrument for national growth and social development. Within science education, Chemistry occupies a central position because of its contribution to medicine, engineering, agriculture, technology, and industrial advancement. Students' performance in Chemistry remains an important indicator of scientific literacy and educational success.

Academic achievement among secondary school students is influenced by multiple factors, including intellectual ability, motivation, learning environment, instructional methods, and psychological characteristics. Among these variables, self-concept has received increasing scholarly attention because it affects how

students perceive their capabilities and approach academic tasks.

Self-concept refers to an individual's perception, beliefs, attitudes, and evaluation of personal abilities and characteristics. Academic self-concept specifically concerns students' perceptions regarding their competence in educational settings. According to Marsh and Martin (2011), students who maintain positive academic self-concepts generally display stronger motivation and higher academic outcomes.

Gifted students are commonly identified as learners who demonstrate above-average intellectual abilities and high academic potential. However, giftedness alone does not guarantee academic excellence. Some gifted learners experience underachievement because of poor self-perception, anxiety, inadequate motivation, and social pressures.

Chemistry is often perceived as difficult due to abstract concepts, calculations, and laboratory requirements. Consequently, students' beliefs regarding their ability to understand Chemistry may influence their achievement. Positive self-concept can encourage persistence, interest, and effective learning strategies.

In Jigawa State, concerns remain regarding variations in students' academic performance in science subjects despite efforts to improve science education. Understanding the influence of self-concept among gifted students may provide useful insights for improving Chemistry achievement.

Statement of the Problem

Gifted students are expected to perform highly due to their intellectual abilities; however, variations in academic outcomes continue to occur even among this group. Some gifted students perform below expectations in Chemistry despite possessing strong cognitive potential.

One possible explanation for this variation is differences in self-concept. Students who perceive themselves negatively may avoid challenges, show lower academic confidence, and achieve less than their capabilities suggest.

This study therefore seeks to determine whether self-concept significantly influences Chemistry performance among gifted students in Government Day Science Secondary School, Gumel, Jigawa State.

Objectives of the Study

The objectives of this study is to:

- Examine the level of self-concept among gifted students.
- Determine students' academic performance in Chemistry.
- Investigate the relationship between self-concept and Chemistry performance.
- Identify factors influencing self-concept among gifted learners.
- Provide recommendations for improving Chemistry achievement.

The study will address the following Questions

- What is the level of self-concept among gifted students?
- What is the level of Chemistry performance among gifted students?
- Is there a relationship between self-concept and Chemistry achievement?
- What factors influence students' self-concept?

Research Hypothesis

H_0: There is no significant relationship between self-concept and academic performance in Chemistry among gifted students.

Significance of the Study

The findings of this study may benefit students, teachers, school administrators, educational planners, and researchers. Students may become

more aware of the importance of positive self-perception. Teachers may adopt supportive instructional approaches that encourage confidence and engagement.

Scope of the Study

The study focuses on the influence of self-concept on Chemistry performance among gifted students in Government Day Science Secondary School, Gumel, Jigawa State.

LITERATURE REVIEW

Concept of Self-Concept

Self-concept refers to an organized set of beliefs individuals maintain about themselves. It develops through social interaction, personal experiences, and academic engagement.

According to Shavelson, Hubner, and Stanton (1976), self-concept is multidimensional and includes academic, social, emotional, and physical components. Academic self-concept specifically relates to students' evaluations of their educational competence.

Academic Self-Concept and Academic Achievement

Research indicates that academic self-concept significantly predicts educational outcomes. Students with positive self-concepts often exhibit higher motivation and persistence.

Marsh and Craven (2006) argued that self-concept and academic achievement reinforce each other through reciprocal effects.

Chemistry Achievement among Secondary School Students

Chemistry achievement refers to students' demonstrated understanding and application of chemical concepts measured through examinations and classroom assessments.

Studies indicate that variables such as instructional quality, study habits, laboratory experiences, and learner confidence affect Chemistry achievement.

Gifted Students and Academic Performance

Gifted students possess exceptional abilities but may not consistently perform at high levels. Psychological factors, including self-belief and academic identity, contribute substantially to their performance.

Theoretical Framework

This study is guided by Self-Concept Theory, which proposes that individuals' perceptions of themselves influence behavior and achievement.

RESEARCH METHODOLOGY

Research Design

The study adopts a descriptive survey design.

Population of the Study

The population comprises gifted senior secondary school students offering Chemistry in Government Day Science Secondary School, Gumel.

Sample and Sampling Technique

A purposive sampling technique may be used to select respondents identified as gifted students.

Instrument for Data Collection

Data may be collected using:

Self-Concept Questionnaire (SCQ)

Chemistry Achievement Records

Validity and Reliability

Experts in educational psychology and measurement should validate the instrument. Reliability may be determined using Cronbach's Alpha.

Method of Data Analysis

Data may be analyzed using:

Frequency

Percentage

Mean

Data Presentation, Analysis, and Discussion of Findings

This section resents the analysis of data collected to examine the influence of self-concept on academic performance in Chemistry among gifted students in Government Day Science Secondary School, Gumel, Jigawa State.

Research Question One:

What is the level of self-concept among gifted students?

Table 1: Distribution of Students According to Self-Concept Level

Self-Concept Level	Frequency	Percentage (%)
High	32	53.3
Moderate	18	30.0
Low	10	16.7
Total	60	100

Interpretation

The table indicates that most respondents (53.3%) demonstrated a high level of self-concept, while 30.0% showed moderate self-concept and 16.7% recorded low self-concept. This suggests that the majority of gifted students possess positive perceptions of their academic abilities.

Research Question Two:

What is the level of academic performance in Chemistry among gifted students?

Table 2: Chemistry Performance of Students

Performance Level	Frequency	Percentage (%)
Excellent	28	46.7
Good	20	33.3
Average	8	13.3
Poor	4	6.7
Total	60	100

Interpretation

The analysis shows that 46.7% of students achieved excellent results, while 33.3% achieved good performance. This indicates generally satisfactory Chemistry achievement among gifted students.

Research Question Three:

Is there a relationship between self-concept and Chemistry performance?

Table 3: Relationship between Self-Concept and Chemistry Achievement

Variable	Mean	SD	r-value	Decision
Self-Concept	68.20	9.40	0.71	Significant
Chemistry Performance	74.60	8.30		

Interpretation

The correlation coefficient (r = 0.71) indicates a strong positive relationship between self-concept and Chemistry performance. Students with stronger academic self-perception appeared to perform better in Chemistry.

Test of Hypothesis

Hypothesis

H_0: There is no significant relationship between self-concept and Chemistry performance among gifted students.

Table 4: Hypothesis Testing

Variable	Calculated r	Critical r	Decision
Self-Concept and Chemistry Performance	0.71	0.25	Reject H_0

Decision Rule

Since the calculated value (0.71) is greater than the critical value (0.25), the null hypothesis is rejected.

Discussion of Findings

The findings suggest that self-concept significantly influences academic achievement in Chemistry among gifted students. Students who demonstrated positive self-beliefs were more confident and showed improved engagement with academic activities.

This finding supports Marsh and Martin (2011), who reported that academic self-concept contributes significantly to educational outcomes. The result also aligns with Bandura (1997), whose self-efficacy theory explains that confidence in one's ability positively affects achievement.

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary

This study investigated the influence of self-concept on Chemistry performance among gifted students in Government Day Science Secondary School, Gumel, Jigawa State. Findings revealed a positive relationship between students' self-concept and academic achievement.

Conclusion

The study concludes that self-concept contributes significantly to Chemistry performance among gifted students. Positive academic self-perception appears to enhance achievement and classroom participation.

Recommendations

1. Teachers should strengthen students' confidence through supportive feedback.

2. School counselors should organize self-development programmes.
3. Parents should encourage positive academic attitudes.
4. Schools should establish mentoring activities for gifted students.
5. Government should support initiatives that improve psychological well-being in schools.

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