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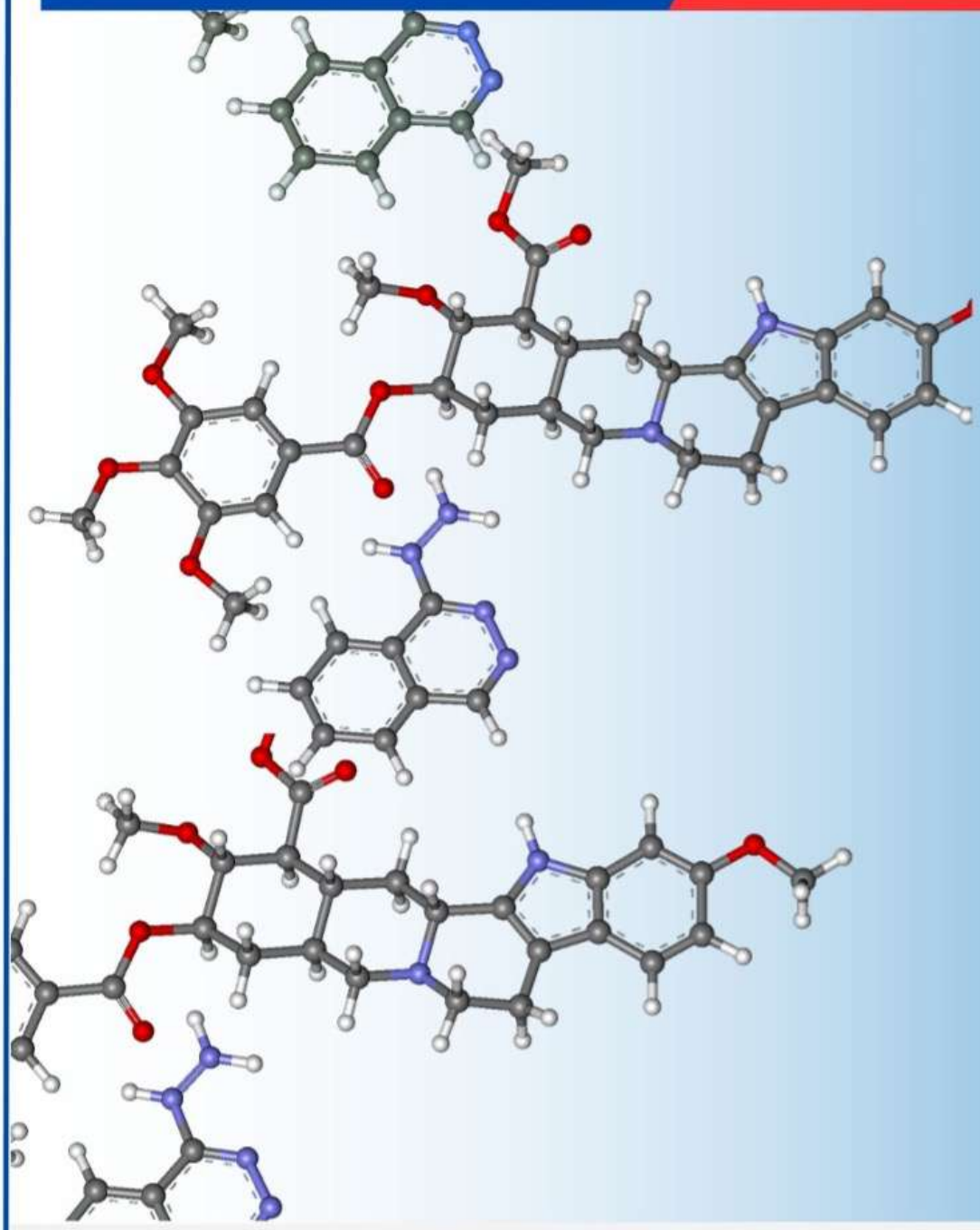

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EDITORIAL

STEM Journal of Anambra STAN (STEMJAS) is a publication of **Science Teachers Association of Nigeria, Anambra State Chapter.** STEMJAS is developed to disseminate information on Science, Technology, Engineering and Mathematics (STEM) to teachers, teacher-trainers, researchers and other interested persons. Articles that are of relevance to STEM education are published in this journal.

We are grateful to the contributors and hope that our readers will enjoy reading these contributions.

Prof. Ebele C. Okigbo
Editor-in-Chief

TABLE OF CONTENT

PERCEIVED INFLUENCE OF ACADEMIC MENTORING ON INTEREST AND ATTITUDE OF SECONDARY SCHOOL CHEMISTRY STUDENTS IN ANAMBRA STATE, NIGERIA

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Abstract

Mentoring plays a very important role in the academic development of students and is essential in decreasing seclusion, fear, psychological ambiguities and uncertainties in students. The researchers investigated Perceived influence of academic mentoring on interest and attitude of secondary school Chemistry students in secondary schools in Anambra state, Nigeria. The study was guided by four research questions and two hypotheses. A descriptive survey design was adopted for the study. The sample consisted of 284 SS11 Chemistry students who were randomly selected from 11 government owned secondary schools used for the study. These schools were selected by purposive sampling from the boarding secondary schools in Anambra state. The instrument used for data collection was a validated structured questionnaire titled "Influence of Academic Mentoring in Enhancing the Interest and Attitude of Chemistry Students" (AMIACS). The questionnaire had a reliability coefficient of 0.79 using Cronbach Alpha technique. The data collected were analyzed using mean and standard deviation to answer the research questions while the hypotheses were tested at 0.05 level of significance using Z test statistics. The result of the analysis shows that academic mentoring enhances students' interest in Chemistry and helps them become more motivated to learn and there was no significant difference on the means of male and female students on the influence of academic mentoring on their interest in chemistry. The result also shows that academic mentoring positively influences Chemistry students' attitude and there was no significant different on the mean responses of male and female students on the influence of academic mentoring on their attitude in Chemistry so both gender exhibits similar improvements in interest and attitude when provided with supportive mentoring. The researchers recommended among others that Mentors should be given proper training on effective mentoring strategies and communication skills. Also mentoring programmes should emphasize the real-life applications of Chemistry to sustain students' interest and help them develop positive attitude towards chemistry. Conclusion was also made.

Keywords: Mentoring, Academic Mentoring, Interest, Attitude, Chemistry Students

Introduction

Mentoring is a structured and trusting relationship that brings young people together with caring individuals who offer guidance, support and encouragement aimed at developing the competence and character of the Mentee. To Liaqat, Naz and Nasreen (2020), mentoring is a process for the informal transmission of skills, aptitudes, proficiency, shared interaction and fair provision in education, livelihood or professional maturity. Butler (2001) sees mentoring as a means of directing learner's education by empowering, supporting and motivating them. Mentoring involves communication and is relationship-based (Dawson, 2023). Mentoring entails information communication, usually face-to-face and during a sustained period of time, between a person who is perceived to have greater relevant knowledge, wisdom or experience (the Mentor) and a person who is perceived to have less (the Mentee. Mentoring is crucial to high quality education because it promotes individual development and growth and ensures the passing on of skills and professional standards to the next generation. There are different types of mentoring. They include traditional one-on-one mentoring, group mentoring, team mentoring, distance mentoring, peer mentoring and academic mentoring.

Academic mentoring is a collaborative relationship where the mentor offers support, feedback and resources (Okebukola, 2019). Academic mentoring involves a knowledgeable guide fostering the intellectual growth of a mentee, providing guidance in research, career development and academic navigation (Oluwatayo & Adeleke, 2019). Academic mentoring enhances academic success, personal development and career advancement (Fasoro & Adenugba, 2022). It is a supportive relationship where a more experienced Mentor provides guidance, knowledge and advice to a less experienced Mentee to help them succeed in their academic pursuit. In secondary schools, academic mentoring refers to a structured support system where older students or teachers provide guidance and assistance to younger students, focusing on improving their academic performance by helping them develop study skills, understand complex concepts, manage time effectively, navigate the challenges of secondary school curriculum often giving beyond simple tutoring to build a more personal relationship and promote overall academic confidence (Butler, 2001). Thus academic mentoring helps the students develop the skills and habits they need to succeed in the long term rather than just focusing on achieving short-term goals (Oppidan Education, 2024). It can help students develop a deeper understanding of the subject matter rather than memorizing information for a test and this will help them develop interest in the subject.

Interest is a desire or positive feeling an individual has for something he/she feels is valuable and beneficial. Interest refers to the psychological state of engaging or predisposition to re-engage with particular class of objects, events or ideas overtime (Hidi & Renninger, 2018). Interest is an individual's behavioural tendency to be attracted towards a certain class or class of activities (Okoro, 2022). Narmadha & Chamundswari (2023) observed that student's interest

towards chemistry had a direct effect on their academic achievement. Interest is an emotionally oriented behavioral trait which determines a pupil's vigour or energy in tackling educational programmes or other activities in learning. Also Okoye, Okongwu & Nweke (2019) affirmed that increase in students' interest leads to increase in their attitude and achievement towards Chemistry.

Attitude is a psychological construct used to explain the directional persistence of human behaviour (Opara, 2020). Attitude is a fundamental psychological construct which refers to individual's dispositions or evaluation of objects, people or situations shaping their behavior and responses (Ajzen, 2018). Attitudes includes one's like or dislike of someone or something and includes an evaluation of whether that someone or something is good or bad, beneficial or harmful, valuable or not valuable. Attitudes occur as a result of communication with family, peers and other people in the neighborhood and are being affected positively or negatively by various affective factors (Brown, 2020). Positive attitudes lead to the exhibition of positive behaviours towards courses of study with participants absorbing themselves in the courses and striving to learn more. Inal, Yildirim & koc (2023) states that attitude refers to our feelings and shapes our behavior towards learning. Positive attitude involves a favourable disposition towards Chemistry while negative attitude reflect aversion or disinterest (Ajayi & Olatoye, 2023).

The level of attitude and interest students used in learning affects success and it differs between male and female students. These differences in interest, attitude, motivation and learning readiness for science subjects between boys and girls are created very early in the African child. Girls are over protected and restricted to the home while boys are allowed and encouraged to explore the environment, playing different games, do hard work and is exposed to scientific activities very early in life than girls. However boys and girls can be helped to do better in sciences and Chemistry in particular through mentoring. Effective mentoring can positively influence students' interest, attitude and performance. Some chemistry students do not have interest in the subject therefore their attitude in studying hard for good grades are poor. This affects their performance in chemistry. Therefore the researchers investigates the perceived influence of academic mentoring on interest and attitudes of secondary school Chemistry students in Anambra state, Nigeria.

Purpose of the Study

The purpose of the study is to investigate the perceived influence of academic mentoring on interest and attitude of Chemistry students in secondary schools in Anambra State. Specifically the study investigated the

1. Perceived influence of academic mentoring on interest of Chemistry students in secondary schools in Anambra State

2. Perceived influence of academic mentoring on interest of male and female Chemistry students in secondary schools in Anambra State

3. Perceived influence of academic mentoring on attitude of Chemistry students in secondary schools in Anambra State

4. Perceived influence o

Research Questions

f academic mentoring on attitude of male and female Chemistry students in secondary schools in Anambra State

The following research questions guided this study

1. What is the perceived influence of academic mentoring on interest of Chemistry students in secondary schools in Anambra State?
2. What is the perceived influence of academic mentoring on interest of male and female chemistry students in secondary schools in Anambra State?
3. What is the perceived influence of academic mentoring on the attitude of Chemistry students in secondary schools in Anambra State?
4. What is the perceived influence of academic mentoring on the attitude of male and female Chemistry students in secondary schools in Anambra State?

Hypotheses

The following hypotheses were tested at 0.05 level of significance

1. There is no significant difference on the mean responses of male and female students on the perceived influence of academic mentoring on their interest in Chemistry in Anambra State.

2. There is no significant difference on the mean responses of male and female students on the perceived influence of academic mentoring on their attitude in Chemistry in Anambra State.

Methods

A descriptive survey design was adopted for the study. The study was carried out in all the 257 government owned secondary schools in the six education zones of Anambra State. The population for the study comprised all the Senior Secondary 11 (SS11) Chemistry students in all the secondary schools in the state. The sample consisted of 284 SS11 chemistry students. Purposive sampling technique was used to select four secondary schools with boarding facilities from government owned secondary schools in Onitsha education zone. Two schools with boarding facilities were selected each from secondary schools in Awka and Nnewi education zones while one school was selected each from Otuocha, Ogidi and Aguata education zones. In each of the schools selected from Onitsha, Awka and Nnewi education zones, 28 students were randomly sampled while 20 students were randomly sampled from each school selected in Otuocha, Ogidi and Aguata zones making a sample size of 284 students.

The instrument used for data collection was a structured researcher's made questionnaire titled Perceived Influence of Academic Mentoring on Interest and Attitude of Chemistry Students" (AMIACS). The instrument had two parts A and B. part A elicited information on the respondents personal/demographic information. Part B contained information on the influence of academic mentoring in enhancing the interest and attitude of secondary school Chemistry students in secondary schools. The response pattern adopted for answering the questionnaire was a four point Likert type scale of Strongly Agree (SD) = 4 points, Agree (A) = 3 points, Disagree (D) = 2 points and Strongly Disagree (SD) = 1 point. The instrument was validated by two lecturers in science education and one from educational foundation all from Nnamdi Azikiwe University Awka. The reliability of the instrument was estimated to be 0.81 using Cronbach Alpha technique.

A total of 284 copies of the questionnaire were administered to the students in their respective schools by the researchers. The researchers purposively administered the questionnaire themselves so that they explain the meaning of academic mentoring to the students before administering the questionnaire. Data collected were analyzed using means and standard deviations for research questions and Z – test statistics was used to test the hypotheses at 0.05 alpha levels. Any item with mean of 2.50 and above was accepted while any item with below 2.50 was not accepted

Results

The results of the study were presented according to the research questions and hypotheses

Table 1: Mean responses on the influence of academic mentoring in enhancing the interest of chemistry students in secondary schools in Anambra state.

S/N	ITEMS	SA	A	D	SD	N	MEAN	S.D	REMARK
1.	Academic mentoring has increased my interest in studying chemistry	120	145	10	9	284	3.32	0.47	Accepted
2.	I feel more motivated to learn chemistry because of the guidance I receive from my mentor	150	125	5	4	284	3.48	0.36	Accepted
3.	Academic mentoring helps me see the practical application of chemistry in everyday life	94	178	5	7	284	3.26	0.37	Accepted
4.	Sometimes academic mentoring feels overwhelming and adds to my academic stress	50	34	60	140	284	1.98	1.31	Rejected
5.	My mentor has encouraged me to explore advanced topics in chemistry and this has increased my interest	145	120	9	10	284	3.41	0.51	Accepted
6.	Academic mentoring has improved my understanding of challenging chemistry concepts	135	140	4	5	284	3.43	0.37	Accepted
7.	Interacting with my mentor has made me more excited about participating in chemistry-related activities	104	140	30	10	284	3.19	0.57	Accepted
8.	There are times when the advice from my mentor conflicts with my own learning style which can be frustrating	34	40	65	145	284	1.87	1.11	Rejected
9.	Academic mentoring has helped me discover career opportunities in chemistry that I hadn't considered before	125	150	5	4	284	3.39	0.35	Accepted
10	The feedback and support	125	140	9	10	284	3.34	0.49	Accepted

	from my mentor have boasted my confidence in tackling difficult chemistry problems			
	Grand Mean	**2.79**	**0.59**	**Accepted**

In table 1, most of the items were accepted by the students meaning that academic mentoring enhances the interest of students in chemistry in secondary schools in Anambra state, only items 4 and 8 were rejected.

Table 2: Mean responses of male and female students on the influence of academic mentoring in enhancing their interest in chemistry in Anambra state.

S/N	Gender	No.	Mean	Standard Deviation
1.	Male	114	2.95	0.76
2.	Female	170	3.01	0.52

Results in table 2 shows that the mean scores of male students is 2.95 and that of female students is 3.01 implying that academic mentoring enhances the interest of female students only slightly more than that of their male counterparts in secondary schools in Anambra State.

Table 3: Mean responses of chemistry students on the influence of academic mentoring in enhancing their attitudes in secondary schools in Anambra state.

S/N	ITEMS	SA	A	D	SD	N	MEAN	S.D	REMARKS
1.	I frequently receive academic attention and advice especially for chemistry	120	140	14	10	284	3.30	0,52	Accepted
2.	Academic advice has helped me to understand difficult chemistry concepts	100	160	18	6	284	3.24	0.43	Accepted
3.	Academic mentoring has increased my desire to pursue a career in a chemistry- related field	140	120	10	14	284	3.35	0.59	Accepted

4.	I feel more confident in my chemistry skills after receiving academic mentoring	160	80	23	21	284	3.33	0.82	Accepted
5.	My performance in chemistry exams and assignments has improved due to academic mentoring	100	170	10	4	284	3.28	0.36	Accepted
6.	Academic mentoring has made chemistry more enjoyable for me	100	160	18	6	284	3.24	0.43	Accepted
7.	Academic mentoring has helped me to develop better study skills in chemistry	98	159	16	11	284	3.21	0.51	Accepted
8.	Academic mentoring can be time-consuming and may interfere with other activities	30	20	129	105	284	1.19	0.85	Rejected
9.	My overall attitude towards studying chemistry has improved because of academic mentoring	134	120	24	6	284	3.34	0.52	Accepted
10.	Academic mentoring sometimes creates dependence, reducing students' self-study skills	20	30	136	98	284	1.90	0.72	Rejected
	Grand Mean						**3.01**	**0.52**	**Accepted**

Results in table three shows that all the items except items 8 and 10 were accepted by the students. This implies that the influence of academic mentoring in enhancing secondary school attitude in chemistry includes all the items in the table. This implies that academic mentoring helps to improve the attitude of chemistry students towards chemistry.

Table 4: Mean responses of male and female students on the influence of academic mentoring in enhancing their attitude in chemistry.

S/N	Gender	No.	Mean	Standard Deviation
1.	Male	114	2.91	1.11
2.	Female	170	2.92	0.62

Results on the table shows that the mean response of male and female chemistry students on the influence of academic mentoring in enhancing their attitude was 2.91 and 2.92 respectively

Table 5*: z-* test Analysis of mean scores of male and female chemistry students on the influence of academic mentoring in enhancing their interest in chemistry

Variables	N	Mean	SD	Level of Significance	z-cal	z-crit.	Decision
Males	114	2.95	0.76	0.05	-0.73	1.96	Not Rejected
Females	170	3.01	0.52				

Results in table 5 indicates that the z-cal (-0.73) is less than the z-crit. (1.96) so the null hypothesis is not rejected.

Table 6: z-test analysis of mean scores of male and female chemistry students on the influence of academic mentoring in enhancing their attitude in chemistry

Variables	N	Mean	SD	Level of Significance	z-cal	z-crit.	Decision
Males	114	2.91	1.11	0.05	-0.09	1.96	Not Rejected
Females	170	2.92	1.92				

Table 7 reveals that the z-cal. (-0.09) is less than the z-crit.(1.96) and so we do not reject the hypothesis

Discussion of Findings

The findings of the study indicate that academic mentoring enhances students' interest in chemistry and helps them become more motivated to learn chemistry. It also helps students to see the practical applications of chemistry in everyday life. This is in agreement with the study of Jacobson and Cross (2022) who opined that student's interest in chemistry grows when they understand how theoretical concepts apply in real-world contexts. The study found out that there was no significant difference on the mean responses of male and female students on the influence of academic mentoring on their interest in chemistry. Hence academic mentoring is beneficial to the enhancement of interest of both male and female chemistry students. The findings of the study are also in agreement with that of Lee and Ko (2023) who opined that academic mentoring has a positive effect on students' engagement and interest in STEM subjects including Chemistry regardless of gender

The findings of this study also indicate that academic mentoring positively enhances students attitude towards chemistry. This finding is supported by Hott & Thomas (2020) who noted that mentoring programmes foster a growth mindset by helping students to gain clarity on difficult concepts and develop problem solving skills which improves their attitudes towards the subject and hence improves their overall academic achievement. Ajayi & Olatoye (2020) also found out that effective mentoring positively influences students' attitude and performance in Chemistry. There was no significant difference on the mean responses of male and female students on the influence of academic mentoring on their attitudes towards chemistry. This is in agreement with the findings of Sharma et al (2021) that reported that gender does not play a significant role in the effectiveness of academic mentoring of students. Each gender exhibits similar improvements in attitude when provided with supportive mentoring.

Conclusion

Academic mentoring should be encouraged in secondary schools because it helps students identify specific goals or needs and directs them towards achieving those goals. Mentoring provides personalized guidance, fostering a supportive learning environment that makes it easier for students to understand complex Chemistry concepts. It also helps students build social-emotional skills and empowers them to gain skills to take them to the next level of success. These tailored approaches not only build students confidence in the subject but also cultivate a genuine interest leading to improved attitude towards Chemistry in particular and science generally.

Recommendations

1. School administrators should ensure careful matching of compatible Mentor-Mentee pairs based on personality, academic needs and shared interests

2. Mentors should be given proper training on effective mentoring strategies and communication skills

3. Mentoring programmes should emphasize the real life applications of chemistry and also appreciate the relevance of the subject in student's real life so that they will be actively involved

4. School administrators and the government should periodically organize professional development workshops for Mentors to equip them with the necessary skills needed to handle diverse student's needs and learning styles effectively

5. The impact of the mentoring programme should be assessed so that adjustments should be made as needed

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