SciencePlus
Vol. 2 Nomor 2 Oktober 2026
ISSN. 3090-3564
https://journal.barkahpublishing.com/index.php/sp

Relationship between parental involvement and students' interest in pursuing biology related careers in Awka South Local Government Area, Anambra State, Nigeria

Regina Ijeamasi Enebechi
Department of Science Education, Nnamdi Azikiwe University, Awka, Anambra state, Nigeria
email: ri.enebechi@unizik.edu.ng
ORCID: [https://orcid.org/0009-0004-2986-2744]

Abstract

This study investigated the relationship between parental involvement and students' interest in pursuing Biology related careers in Awka South Local Government Area of Anambra State, Nigeria. Three research questions and three hypotheses tested at the 0.05 level of significance guided the study. A correlational survey research design was adopted. The population of the study comprised 2,339 (936 males and 1,403 females) Senior Secondary School Two (SS2) students offering Biology in 19 public secondary schools in Awka South Local Government Area. A sample of 345 students (103 males and 242 females) selected through a multistage sampling procedure participated in the study. Two instruments were used for data collection: The Parental Involvement Scale (PIS) and the Students' Interest in Pursuing Biology related Careers Scale (SIPBCS). The instruments demonstrated acceptable internal consistency with Cronbach alpha coefficients of 0.77 and 0.85 respectively. Mean and standard deviation were used to answer research questions one and two, while multiple correlation analysis was used to answer research question three. Pearson Product Moment Correlation was used to test the hypotheses at a 0.05 level of significance. The findings revealed a low positive and non-significant relationship between school based and school volunteering parental involvement and students' interest in pursuing Biology related careers. Furthermore, gender significantly moderated the relationship between parental involvement and students' interest in Biology related careers. Based on the findings, it was recommended that parents adopt a supportive but non-intrusive approach to their children's academic and career development.

Keywords: Biology-related careers, parental involvement, students' interest.

INTRODUCTION

Science plays a fundamental role in national development and technological advancement. It involves the systematic acquisition of organized knowledge about the natural and physical world through observation, experimentation, and prediction (Abanikannda, 2018). As such, science contributes significantly to societal progress, innovation, and economic growth. In support of this view, Ojelade *et al* (2020) described science as an indispensable component of human activities, emphasizing that modern societies rely heavily on scientific knowledge to improve the quality of life and drive technological advancement. Consequently, science education is strongly emphasized across different levels of education through subjects such as Basic Science and Technology, Chemistry, Physics, Agriculture, and Biology. Biology is one of the major branches of science concerned with the study of living organisms and their interactions with the environment. Enebechi & Nzewi (2017) described Biology as the study of both living and non-living components of the environment. The subject occupies a central position in the secondary school curriculum because it provides foundational knowledge required for several science-related disciplines. According to Enebechi & Menkiti (2019), Biology serves as a prerequisite for professional programmes such as Medicine, Nursing, Pharmacy, Microbiology, and Biochemistry. Due to its relevance and perceived accessibility, Biology consistently records high enrolment in external examinations such as the West African Senior School Certificate Examination (WASSCE) conducted by the West African Examinations Council (WAEC).

Despite the high enrolment in Biology, students' performance in the subject has continued to generate concern among educators and policymakers. Reports from WAEC Chief Examiners between 2020 & 2024 identified several recurring weaknesses among candidates. These include poor spelling of biological terms, inability to follow instructions when producing biological drawings, inadequate knowledge of specimen collection tools, and difficulty relating adaptive features of organisms to their environments. Students also demonstrated limited competence in writing reports of biological experiments. These persistent challenges have attracted the attention of researchers and educational stakeholders, prompting investigations into factors that may influence students' learning outcomes in Biology.

Several studies have identified different factors responsible for students' poor academic performance in Biology. Enebechi & Menkiti (2019), Idoko & Njoku (2017) highlighted factors such as teachers' reliance on lecture methods, unconducive learning environments, inadequate instructional materials, lack of well-equipped Biology laboratories, insufficient practical equipment, large class sizes, and the broad scope of the Biology curriculum. Similarly, Uzoma & Okoli (2019) identified teaching methods, availability of instructional materials, and students' socioeconomic background as factors influencing academic achievement in Biology. These factors may reduce students' enthusiasm for the subject and discourage them from pursuing Biology-related careers.

Students' interest plays a significant role in their engagement in learning activities and in shaping their career aspirations. Interest can be described as a psychological state characterized by focused attention, curiosity, and active involvement in a particular activity or subject. Enebechi (2025) defined interest as the feeling experienced when an individual's attention, concern, or curiosity is strongly engaged. In educational settings, Ezeiruaku *et al* (2024) described interest as students' increased attention and concentration during classroom activities. As a motivational factor, interest encourages learners to actively participate in academic tasks and explore related fields of knowledge. Students who develop interest in a particular field are more likely to devote time and effort to learning and exploring it. Onu *et al* (2020) observed that students who show interest in specific academic areas tend to pay closer attention, engage more deeply with related concepts, and participate actively in learning activities. Consequently, students' interests may significantly influence their educational and career choices.

Career aspirations are often shaped by several social and environmental factors, including parental involvement. Dorot & Davidovitch (2023) Kansal & Yadav (2021) noted that parents play an important role in influencing their children's career aspirations. Parental involvement refers to the active participation of parents in their children's educational experiences and overall development. Ishak *et al* (2020) described parental involvement as a dynamic interaction among parents, children, and schools through which social, financial, and human resources are mobilized to support students' educational development. Similarly, Sanni *et al*(2024) defined parental involvement as parents' proactive engagement in their children's academic progress, personal development, and career decision making.

Parental involvement may manifest in different ways. Ugwu (2021) noted that parents may participate in school governance, volunteer in school activities, or provide learning resources to support their children's education. Sanni et al. (2024) also highlighted activities such as assisting children with homework, discussing future careers, and maintaining communication with teachers. Kaplan Toren (2013) categorized parental involvement into two major forms: home-based involvement and school-based involvement. Home-based involvement includes activities carried out at home, such as monitoring schoolwork, encouraging learning, and establishing study routines. School-based involvement refers to parents' participation in school activities, communication

with teachers, and involvement in school governance. These forms of involvement may influence students' academic development and career aspirations.

Career selection is an important developmental process for students. According to Sanni et al. (2024), career decisions are significant because they often determine individuals' professional paths throughout their lives. Kansal and Yadav (2021) further emphasized that career choices can either create opportunities for success or limit individuals' prospects. Therefore, students must carefully consider their interests, abilities, and long-term goals when making career decisions.

Empirical studies have suggested that parental involvement may influence students' career aspirations. For instance, Nwani et al. (2022) and Adekoya et al. (2023) reported that parental engagement significantly influences students' decisions to pursue careers in science, technology, engineering, and mathematics (STEM). Similarly, Adikwu & Ereka (2022) and Egbo et al. (2023) indicated that parents' strategies for supporting their children's education can influence whether students explore diverse career opportunities or follow career paths preferred by their parents. Other studies supporting the influence of parental involvement on students' career aspirations include Qudsyi *et al* (2020), Kansal & Yadav (2021), Ezeani et al. (2023), and Onoshakpokaiye (2023). However, contrasting findings have also been reported. Alaydrus & Rahman (2025) found that parental involvement did not significantly influence students' career choices, suggesting that other social factors may play more dominant roles. These inconsistent findings highlight the need for further empirical investigation.

The influence of parental involvement on students' career aspirations may also vary across sociocultural factors such as gender. Gender refers to socially constructed roles, behaviours, and expectations associated with males and females (Musa & Sa'ad, 2024). Research findings regarding gender differences in parental influence remain inconclusive. Chen (2021) reported that some parents prioritize the career development of male children over female children. Conversely, Makinde et al. (2022) observed that parents often engage in supportive communication that encourages daughters to pursue their career interests. Similarly, Ramadhani & Suharso (2020) and Zhu et al. (2023) reported that parental educational and career-related support may have stronger effects on female students than on male students. Hassan et al. (2022) also indicated that gender significantly influences the relationship between parental involvement and students' career choices, while Anzaa & David (2024) reported that gender moderates the relationship between parental involvement and students' career interests. Given these mixed findings and the limited empirical evidence on this issue within Awka South Local Government Area of Anambra State, it becomes necessary to investigate the relationship between parental involvement and students' interest in pursuing Biology-related careers.

Statement of the Problem

Selecting a career is one of the most important decisions individuals make in their lives because it often determines their professional development, lifestyle, and future opportunities. However, many students experience difficulties when making career related decisions due to limited exposure to career information, uncertainty about their interests, or insufficient guidance. Parents are often the primary source of guidance for children regarding education and career development. Through their experiences, expectations, and values, parents can shape their children's perceptions of various professions and influence their career aspirations. In many cases, students rely on their parents for advice and encouragement when making career related decisions. However, not all parents possess adequate knowledge of career opportunities available to their children, particularly in specialized areas such as Biology related professions. Parents with limited access to career information may be unable to provide appropriate guidance to their children. Consequently, limited parental involvement may influence students'

interest in pursuing certain career paths. Conversely, parents who actively participate in their children's academic and career development may positively influence their children's interests and aspirations. The nature and extent of this involvement may vary depending on factors such as parental educational background, access to information, and sociocultural expectations. Gender may also influence the type of encouragement or guidance parents provide to male and female children.

Given the importance of parental involvement in shaping students' educational and career aspirations, it becomes necessary to investigate whether such involvement is related to students' interest in pursuing Biology related careers. Therefore, this study examined the relationship between parental involvement and students' interest in pursuing Biology related careers in Awka South Local Government Area of Anambra State.

Purpose of the Study

The purpose of this study was to determine the relationship between parental involvement and students' interest in pursuing Biology related careers in Awka South Local Government Area. Specifically, the study sought to determine the:

1. Relationship between parental involvement (home based, school-based, and parental school volunteering) and senior secondary school students' interest in pursuing Biology related careers in Awka South Local Government Area.
2. Relationship between parental involvement (home based, school-based, and parental school volunteering) and male senior secondary school students' interest in pursuing Biology related careers in Awka South Local Government Area.
3. Relationship between parental involvement (home-based, school-based, and parental school volunteering) and female senior secondary school students' interest in pursuing Biology related careers in Awka South Local Government Area.

Research Questions

The following research questions guided the study:

1. What is the relationship between parental involvement (home-based, school-based, and parental school volunteering) and senior secondary school students' interest in pursuing Biology related careers in Awka South Local Government Area?
2. What is the relationship between parental involvement (home-based, school-based, and parental school volunteering) and male senior secondary school students' interest in pursuing Biology-related careers in Awka South Local Government Area?
3. What is the relationship between parental involvement (home-based, school-based, and parental school volunteering) and female senior secondary school students' interest in pursuing Biology-related careers in Awka South Local Government Area?

Hypotheses

The following null hypotheses were tested at the 0.05 level of significance:1. There is no significant relationship between parental involvement (home-based, school-based, and parental school volunteering) and senior secondary school students' interest in pursuing Biology-related careers in Awka South Local Government Area.
2. There is no significant relationship between parental involvement and male students' interest in pursuing Biology-related careers in Awka South Local Government Area.
3. There is no significant relationship between parental involvement and female students' interest in pursuing Biology-related careers in Awka South Local Government Area.

METHOD

The study adopted a correlational survey research design to determine the relationship between parental involvement and students' interest in pursuing Biology related careers. The study was conducted in Awka South Local Government Area of Anambra State, Nigeria, which has several public secondary schools offering Biology at the senior secondary school level.

The population of the study comprised 2,339 Senior Secondary School Two (SSS2) students offering Biology in the 19 public secondary schools in Awka South Local Government Area. The population consisted of 936 male students and 1,403 female students (Statistics and Planning Unit, Post Primary Schools Service Commission of Anambra State, 2025). A sample of 345 SSS2 students (103 males and 242 females) was selected using a multistage sampling procedure. First, purposive sampling was used to select the 16 government-owned co-educational schools in the area to ensure representation of both genders. Second, simple random sampling (balloting without replacement) was used to select four schools from the sixteen. Third, one intact class of SSS2 students was randomly selected from each of the chosen schools.

Two instruments were used for data collection: the Parental Involvement Scale (PIS) adapted from Kaplan Toren (2013) and the Students' Interest in Pursuing Biology-related Careers Scale (SIPBCS) adapted from Knekta et al. (2020). The Parental Involvement Scale measured home-based involvement, school-based involvement, and parental school volunteering. Minor adaptations were made to both instruments, including the addition of a consent statement and demographic section. Some items were modified for clarity, and the response formats were changed to a four-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (4) to enhance students' understanding. The instruments were validated by three experts, including two from the Department of Science Education and one from the Measurement and Evaluation Unit of the Department of Educational Foundations at Nnamdi Azikiwe University, Awka. Their suggestions were incorporated to ensure face and content validity. A trial test involving 30 SSS2 students in Awka North Local Government Area was conducted to determine reliability. Cronbach's alpha was used to determine internal consistency. Reliability coefficients obtained were 0.735 for home-based involvement, 0.662 for school-based involvement (after deleting item 10), and 0.896 for school volunteering. The overall reliability coefficient for the Parental Involvement Scale was 0.770, while the Students' Interest in Pursuing Biology-related Careers Scale yielded 0.850, indicating acceptable internal consistency. The instruments were administered by the researcher with the assistance of two trained research assistants. The questionnaires were distributed and retrieved on the same day to ensure a high return rate.

Data were analyzed using mean and standard deviation to answer research questions one and two, while multiple correlation analysis was used for research question three. Pearson Product Moment Correlation (PPMC) was used to test the hypotheses at 0.05 level of significance. Relationship strength was interpreted as high (0.80 and above), moderate (0.31–0.79), and low (0.30 and below). The decision rule for hypothesis testing was that null hypotheses were rejected when $p \leq 0.05$ and accepted when $p > 0.05$.

RESULT AND DISCUSSION

Research Question One

What is the relationship between parental involvement (home-based, school-based, and parental school volunteering) and senior secondary school students' interest in pursuing Biology-related careers in Awka South Local Government Area?

Table 1: Pearson Correlation of parental involvement (home-based, school-based, and parental school volunteering) and senior secondary school students' interest in pursuing Biology-related careers

			MEAN	SD	1	2	3	4
1	HBPI	Pearson Correlation	19.422	3.163				
		Sig. (2-tailed)						
		N			334			

2	SBPI	Pearson Correlation	12.253	3.216	.178			
		Sig. (2-tailed)			0.001			
		N			325	336		
3	SV	Pearson Correlation	8.790	2.209	0.033	.334		
		Sig. (2-tailed)			0.546	0		
		N			332	334	343	
4	SIPBC	Pearson Correlation	85.144	16.199	-0.041	0.002	0.007	
		Sig. (2-tailed)			0.494	0.98	0.901	
		N			281	287	289	291

Correlation is significant at the 0.01 level (2-tailed)

H_BPI = Home-based Parental Involvement, S_BPI = School-based Parental Involvement, SV = School Volunteering, SIPBC = Students' Interest in Pursuing Biology-related Careers

Table 1 shows a Pearson correlation coefficient of -0.041 for the relationship between home-based parental involvement and senior secondary school students' interest in pursuing Biology-related careers. This coefficient indicates a very weak negative relationship between the variables. Similarly, the Pearson correlation coefficients of 0.002 and 0.007 obtained for the relationships between school-based parental involvement and parental school volunteering with students' interest in pursuing Biology-related careers respectively indicate very weak positive relationships between the variables.

Overall, the results suggest that the three dimensions of parental involvement examined in this study have minimal relationships with students' interest in pursuing Biology-related careers.

Hypothesis One

There is no significant relationship between parental involvement (home-based, school-based, and parental school volunteering) and senior secondary school students' interest in pursuing Biology-related careers in Awka South Local Government Area.

Table 1 also presents p-values of .494, .980, and .901 for the relationships between home-based parental involvement, school-based parental involvement, and parental school volunteering and students' interest in pursuing Biology-related careers respectively. Since these p-values are greater than the 0.05 level of significance, the null hypothesis is not rejected. This implies that no statistically significant relationship exists between parental involvement and senior secondary school students' interest in pursuing Biology-related careers in Awka South Local Government Area.

Research Question Two

What is the relationship between parental involvement (home-based, school-based, and parental school volunteering) and male senior secondary school students' interest in pursuing Biology-related careers in Awka South Local Government Area?

Table 2: Pearson Correlation of parental involvement (home-based, school-based, and parental school volunteering) and male senior secondary school students' interest in pursuing Biology-related careers

			MEAN	SD	1	2	3	4
1	HBPI	Pearson Correlation	20.576	2.429				
		Sig. (2-tailed)						
		N			99			
2	SBPI	Pearson Correlation	12.566	2.458	0.04			
		Sig. (2-tailed)			0.704			
		N			95	99		
3	SV	Pearson Correlation	9.214	2.460	-0.161	.531		
		Sig. (2-tailed)			0.111	0		
		N			99	99	103	
4	SIPBC	Pearson Correlation	96.494	11.015	0.13	0.157	0.088	
		Sig. (2-tailed)			0.264	0.172	0.439	
		N			76	77	79	79

Correlation is significant at the 0.01 level (2-tailed)

HBPI = Home-based Parental Involvement, SBPI = School-based Parental Involvement, SV = School Volunteering, SIPBC = Students' Interest in Pursuing Biology-related Careers

Table 2 presents Pearson correlation coefficients of 0.130, 0.157, and 0.088 for the relationships between home-based parental involvement, school-based parental involvement, and parental school volunteering and male students' interest in pursuing Biology-related careers respectively. These coefficients indicate weak positive relationships between the variables. This suggests that although parental involvement may have a slight positive association with male students' interest in Biology-related careers, the strength of the relationships is very low.

Hypothesis Two

There is no significant relationship between parental involvement (home-based, school-based, and parental school volunteering) and male senior secondary school students' interest in pursuing Biology-related careers in Awka South Local Government Area.

Table 2 further shows p-values of .264, .172, and .439 for the relationships between home-based parental involvement, school-based parental involvement, and parental school volunteering and male students' interest in pursuing Biology-related careers. Since these p-values are greater than the 0.05 level of significance, the null hypothesis is not rejected. This indicates that no statistically significant relationship exists between parental involvement and male students' interest in pursuing Biology-related careers.

Research Question Three

What is the relationship between parental involvement (home-based, school-based, and parental school volunteering) and female senior secondary school students' interest in pursuing Biology-related careers in Awka South Local Government Area?

Table 3: Pearson Correlation of parental involvement (home-based, school-based, and parental school volunteering) and female senior secondary school students' interest in pursuing Biology-related careers

			MEAN	SD	1	2	3	4
1	HBPI	Pearson Correlation	18.936	3.311				
		Sig. (2-tailed)						
		N			235			
2	SBPI	Pearson Correlation	12.122	3.481	.197			
		Sig. (2-tailed)			0.003			
		N			230	237		
3	SV	Pearson Correlation	8.608	2.071	0.066	.270		
		Sig. (2-tailed)			0.315	0		
		N			233	235	240	
4	SIPBC	Pearson Correlation	80.915	15.799	-.216	-0.054	-0.093	
		Sig. (2-tailed)			0.002	0.44	0.181	
		N			205	210	210	212

Correlation is significant at the 0.01 level (2-tailed)
H_BPI = Home-based Parental Involvement, S_BPI = School-based Parental Involvement, SV = School Volunteering, SIPBC = Students' Interest in Pursuing Biology-related Careers

Table 3 presents Pearson correlation coefficients of -0.216, -0.054, and -0.093 for the relationships between home-based parental involvement, school-based parental involvement, and parental school volunteering and female students' interest in pursuing Biology-related careers respectively. These coefficients indicate weak negative relationships between the variables. This suggests that higher levels of parental involvement are slightly associated with lower levels of female students' interest in pursuing Biology-related careers.

Hypothesis Three

There is no significant relationship between parental involvement (home-based, school-based, and parental school volunteering) and female senior secondary school students' interest in pursuing Biology-related careers in Awka South Local Government Area.

Table 3 shows a p-value of .002 for the relationship between home-based parental involvement and female students' interest in pursuing Biology-related careers. Since this value is less than the 0.05 level of significance, the null hypothesis is rejected for this variable. This indicates that a statistically significant relationship exists between home-based parental involvement and female students' interest in Biology-related careers. However, the p-values of .440 and .181 for school-based parental involvement and parental school volunteering respectively are greater than the 0.05 significance level, indicating that these relationships are not statistically significant.

Discussion of Findings

Relationship between Parental Involvement and Students' Interest in Pursuing Biology related Careers

The findings of this study reveal that parental involvement in students' academic activities, whether at home, within the school environment, or through volunteering in school activities, has little influence on students' interest in pursuing Biology-related careers. Although slight variations were observed in the direction of the relationships, with some being positive and others negative, the strength of the relationships across the different dimensions of parental involvement was generally extremely weak.

Furthermore, the hypothesis testing results indicate that none of the relationships between parental involvement and students' interest in Biology-related careers were statistically significant. This implies that the observed associations could have occurred by chance rather than representing meaningful relationships between the variables.

These findings suggest that although parental involvement plays an important role in students' general academic development, other factors may have stronger influence on students' career interests, particularly in Biology-related fields. Such factors may include students' personal motivation, peer influence, quality of Biology instruction, exposure to scientific role models, and opportunities for practical engagement in science-related activities.

The findings contradict the results of Nwani et al. (2022) and Adekoya et al. (2023) who reported that parents' active participation in their children's education significantly influences students' career aspirations in STEM-related fields. Similarly, the findings differ from Adikwu & Ereka (2022) and Egbo et al. (2023) who posited that parents often influence their children's exploration of career opportunities and sometimes shape their career preferences.

However, the findings of this study align with the more recent work of Alaydrus & Rahman (2025) which suggested that parental involvement may not significantly influence students' career choices. According to the researchers, broader social and educational factors may exert stronger influence on students' career decision-making than parental involvement alone.

Gender Moderation in the Relationship between Parental Involvement and Students' Interest in Pursuing Biology-related Careers

The findings further reveal gender-based differences in the relationship between parental involvement and students' interest in pursuing Biology-related careers.

For male senior secondary school students, parental involvement across home-based, school-based, and school volunteering dimensions showed weak positive relationships with their interest in Biology-related careers. However, these relationships were not statistically significant, suggesting that parental engagement may have only a minimal influence on male students' career interests in Biology. In contrast, the pattern observed among female senior secondary school students was different. The results indicate weak negative relationships between the various dimensions of parental involvement and female students' interest in pursuing Biology related careers. Interestingly, home-based parental involvement showed a statistically significant relationship with female students' interest, although the relationship was negative. This significant negative relationship may suggest that certain forms of home-based parental involvement could be perceived as excessive supervision or pressure, which may inadvertently reduce female students' enthusiasm for pursuing careers in Biology-related fields. On the other hand, school-

based parental involvement and school volunteering did not show significant relationships, indicating that these forms of involvement may have limited influence on female students' career interests. Overall, these findings highlight the importance of considering gender differences when examining the role of parental involvement in shaping students' career aspirations. The results suggest that the nature and influence of parental involvement may vary across gender groups. The findings are consistent with Chen (2021) who reported that some parents tend to prioritize the career development of male children over female children. Similarly, Hassan et al. (2022) and Anzaa & David (2024) also reported that gender plays a significant role in the relationship between parental influence and students' career choices.

However, the findings contradict Makinde et al. (2022) who argued that parents often engage in supportive communication strategies to influence their daughters' career decisions. Similarly, the results differ from the findings of Ramadhani & Suharso (2020) and Zhu et al. (2023) who reported that parental influence tends to have stronger effects on female students' educational and career decisions

CONCLUSION

The findings of this study demonstrate that parental involvement, whether carried out at home, within the school environment, or through volunteering activities in schools, has little influence on senior secondary school students' interest in pursuing Biology-related careers. Although slight differences were observed in the direction of the relationships, the overall relationships were generally weak and statistically insignificant. The study also reveals gender-based differences in how parental involvement relates to students' interest in Biology-related careers. While male students showed weak positive but non-significant relationships**,** female students exhibited weak negative relationships**,** with home-based parental involvement emerging as a significant factor for female students**.**

These findings suggest that students' interest in Biology-related careers may be shaped more strongly by other social, psychological, and educational factors rather than parental involvement alone**.** Consequently, efforts to promote interest in Biology-related careers should extend beyond parental engagement to include broader interventions that stimulate students' motivation and exposure to scientific opportunities.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Students should be encouraged to take personal responsibility in exploring career opportunities, particularly in Biology-related fields.
2. Schools should organize mentorship programmes, science clubs, and career workshops to expose students to various Biology-related professions.
3. Parents should adopt a supportive but non-intrusive approach when guiding their children's academic and career decisions.
4. School career counsellors should be adequately trained to identify students' interests early and provide individualized guidance that supports both male and female students.
5. Schools should design programmes aimed at addressing gender disparities in science career interests.
6. Schools should create structured platforms for parent–school collaboration, enabling parents to support their children's career development effectively without exerting undue pressure.

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