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RESEARCH ARTICLE

FACTORS INFLUENCING SECONDARY SCHOOL FEMALE STUDENTS' CHOICE OF SCIENCE SUBJECTS IN NIGER STATE: THE NEED FOR COUNSELING

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Abstract

The major goal of this study is to investigate characteristics that influence secondary school female students' choice of science disciplines and the need for counselling in Niger State, Nigeria. The study gathered data from 250 female respondents from five different girls-only secondary schools. The study took a quantitative method, with data collected via questionnaires. All ethical problems, such as obtaining permission for data collection from responsible authorities and maintaining respondent confidentiality, were adhered to. For data analysis, descriptive statistics were utilized. The study discovered that certain elements have a strong influence on female students' decisions to pursue science topics and have sustaining power over female students' choice and continuation of science subjects. The data reveal that the availability of suitable professors, peer groups, family background, IQ, student ability to access adequate instructional materials, and the lack of career guidance/counseling services all influence female students' choice of Science topics. According to the report, parents and teachers should work together to guide and influence female kids to pursue science topics. To encourage more female students to pursue science, the government should work to ensure that there are enough Science teachers, adequate teaching and learning facilities in schools, including textbooks and equipment. Female Science students should be given more privileges, particularly in terms of accessing scholarships. Female students should be exposed to vocational counselling services, and educational practices that favour the girl child should be embraced and encouraged more so.

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Introduction:-

Science is both a method and a body of information. Children learn science by being involved in both the content and the technique of the subject. Science study necessitates several unique instructional resources in addition to those used across the board in education. A scientific Centre must have enough room to handle this range, as well as hands-on learning methodologies. Scientific instructional rooms have different spatial and material requirements than a general-purpose classroom. National, state, and local governmental and commercial efforts are undertaken to improve science education. The creation of scientifically literate citizens who can think critically, make sense of

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complex facts, and solve issues is a major goal of education in the twenty-first century. At this time, it appears that the goals for enhancing scientific literacy have not been met. Enrollment in science is low, achievement in some grades is dropping, and teacher morale is low. In the past, kids with higher intellectual abilities were chosen to study Science and Mathematics in secondary schools (Voogot, 2001). Between 2004 and 2014, the number of secondary schools, as well as the number of students enrolled, more than tripled to serve various neglected populations. Despite these achievements, there have been a number of challenges, including poor performance in secondary education examinations, with most students receiving a marginal pass of Division IV or failing completely, acute teacher shortages, particularly in the sciences and mathematics, with many students unable to do these subjects at all, acute shortages of Science and Mathematics teachers, inequalities in learning environments among different schools as a result of these shortages, and inequalities in learning environments among different schools as a result of these shortages. New drug-resistant diseases, the impacts of genetic research and engineering, the ecological impact of contemporary technology, the hazards of nuclear war and explosions, and global warming are just a few of the issues (Alsop & Hicks, 2001). As a result, rapid changes are occurring in industries such as manufacturing, communication, agriculture, and medicine. By boosting technical growth, expanding national prosperity, enhancing health, and industrialization, science as a development tool plays a significant role in bringing about these changes (Validya, 2003).

The following are the broad aims of secondary education within the overarching national objectives as stated in the Federal Republic of Nigeria's National Policy on Education (FRN, 2004):

1. Preparation for a productive life in society; and
2. Preparation for postsecondary education

Hill and King (1993) stated that educating girls and women has far-reaching benefits for individuals, their families, and the cultures in which they live. The advantages of investing in human capital are particularly important for women in underdeveloped countries, where gender equity in education is frequently lacking. National endeavours can be less effective if women are not educated, and women's efforts are weaker. The importance of equitable educational opportunities for both sexes cannot be overstated. In a number of developing countries, however, women's educational engagement is marked by low enrolment and poor performance.

Guidance and counselling is a helpful profession that focuses on molding, reconstructing, and rehabilitating troubled individuals. It's a self-disclosing partnership that can both prevent and treat dysfunctional behaviour. It is widely understood that guidance and counselling activities are for human beings, whether normal and aberrant, with or without issues. The introduction of modern guidance and counselling in secondary schools in Nigeria, on the other hand, is based on recognition of the need for a more complex and comprehensive package to assist individuals in dealing with the challenges and concerns of modern life.

Guidance and counselling are key educational tools for molding a child's orientation away from harmful beliefs instilled in him or her by classmates. As a result, a school counsellor is required to aid the youngster in shaping their destiny through counselling therapy. Students regard the school counsellor as a role model and hold him in high regard. Counselors are required to be friends with school children, listen to their complaints and shortfalls, and offer assistance to the children in order to mold them into the best person they can be in their life path. "A child's whole growth can only take place in an environment suitable to teaching and learning," according to Egbo (2013). All of this is realised in the realisation of the preceding.

Educational planners place a premium on educational services that can improve teaching and learning in schools. Counseling is one of the educational services provided by the institution. Guidance and counselling services in schools are thought to help establish, assess, and improve educational programmes, increase teaching and teacher competence, and save costs for students. Guidance in schools is a part of the school's curriculum dedicated to assisting students in realising their full potential as they prepare for adulthood and job (Concubhair, 1981). Guidance and counselling, according to Akinade (2012), is a process of assisting an individual in becoming completely aware of him and the manner in which he is responding to the influences of his surroundings. It also helps him to find a personal meaning for his actions and to create and categorise a set of goals and ideals for himself.

Upcoming behaviourcounseling, according to Oviogbodu (2015), is a set of processes for supporting a person in resolving his problems. Counseling is more emotionally involved in the affective domain of individualised learning, which includes emotions and sentiments, values, and attitudes. Counseling is a two-way or multi-way contact or

relationship between two or more people, known as the client-counselor relationship of trust (Geshinde 1991; Adebowale, 2012; cited in Oviogbodu, 2015). Counseling is a learning process in which a counsellor assists an individual or individuals in learning, understanding themselves and their environment, and choosing the appropriate behaviours to help them develop, grow, progress, ascend, mature, and step up educationally, vocationally, and sociopersonally (Egbo, 2013). According to study conducted by Ebizie, Enajedu, and Nkechi(2016), counselling is a transforming process that assists people in learning all that is to be learned both in and outside of school.

1. Prepare students academically, professionally, and socially for the demands of the twenty-first century. A person's/a person's/a person's/a person'
2. The educational programme is linked to future success.
3. Allows you to explore and expand your professional options.
4. Develops problem-solving and decision-making abilities.
5. Assists in the acquisition of self- and other knowledge.
6. Personal development is aided.
7. Assists in the development of interpersonal relationship skills that are effective.
8. Increases awareness of our ever-changing world.
9. Advocates on behalf of pupils.
10. Encourages peer interactions that are both facilitative and cooperative.
11. Students' resilience factors are cultivated.
12. Ensures that all students have equal access to educational opportunities.

The Problem Stated

Despite the rise in access to education for most Nigerian female children, the incidence of female students abandoning science in Nigeria is not encouraging; especially in the study zone (Niger State). In Nigeria, low female enrollment in science disciplines has remained a serious issue in education in the twenty-first century. In accordance with the National Policy on Education, the Joint Admissions and Matriculation Board (JAMB) has made significant efforts to maintain a target ratio of 60:40 Science/Arts in her university entrance. Contrary to popular belief, the female, over the years, student university enrollment has remained skewed toward the arts. The percentages of science and technology enrollment in the first five years of the 1970s and the first five years of the 1980s are shown in Yoloye's (1988) study. Yoloye pointed out that the 60:40 ratios have never been achieved in any of the years. He went on to say that in the early 1970s, we were closer to the ratio than in the early 1980s. Since 1981-82, however, there has been a steady but modest improvement. Equally concerning is the fact that the majority of students that choose science choose just biology over chemistry and physics (WAEC, 1999). The majority of these students enrol in biology because it is the simplest science subject for them (Ango and Sila, 1986). Another related issue is gender discrepancy in science enrollment. In Nigeria, girls and women are chronically underrepresented in science, technology, and mathematics (STM). According to Maduabum (1994), available statistics show that enrolment figures for girls and women in secondary and postsecondary education are comparatively low. This has been proven at the secondary school level (Maduabum, 1996, Akinseinde and Ariehe, 2000, Salau, 2002, Israel, 2005, Longbap and Nok, 2007), as well as at the university level (Maduabum, 1996, Akinseinde and Ariehe, 2000, Salau, 2002, Israel, 2005, Longbap and Nok, 2007). (Abdulraman, 1992; Nkpa, 1993; Maduabum, 1994, Maduabum, 2000, Maduabum, 2005). In a survey of total student enrolment by discipline and gender by Federal Universities from 1993/94 to 1997/98, Maduabum (2005) found that considerably more males than females were enrolled in STM and STM-related courses in Nigerian Federal Universities during the study period. He went on to say that this is in stark contrast to the enrolment pattern in the Arts. It's worth noting (Salau, 2002) that female enrollment in English, history, government, religion, and social sciences education programmes is typically greater than in physics, chemistry, mathematics, and technology education programmes. The author would like to point out that certain factors are undoubtedly to blame for the gender gap in enrollment.

The Study's Objectives:-

To investigate the factors that influence students' choices of science subjects and the implications for counselling. This research has a specific goal in mind:

In Niger State, investigate the factors that influence female students' choice of science subjects.

To look into the interest of female students in vocational/career counselling services in science subjects' selection.

Questions to Ponder

What variables influence female students' decision to study science?

Do occupational counselling services help female students maintain their interest in science?

Methodology:-

This study employed a survey research design. The study enlisted the participation of 200 female students in total. A basic random sampling procedure was used to select the sample. For data collection, the researchers employed a well-structured expert-designed instrument called FACSSQ (factors affecting choice of scientific subjects' questionnaire). There are two portions to this instrument: A and B. Section A provided biographical information about the respondents, whereas Section B contained information about the issue. The split-half method was used to confirm the instrument's reliability. The correlation coefficient was 0.78, which was strong enough to assess the instrument's dependability. The researcher personally handed out copies of the questionnaire to the respondents with the help of the school leaders. Frequency counts and percentages were used to analyze the data.

Table 1:- The Sample Size per school is displayed for chosen schools in Niger State.

S/N	Schools Selected	School Type	Sample Size
1.	Govt Gils Day Sec. Sch Suleja	Girls only	50
2.	Maryam Babangida Science Coll. Minna	Girls only	50
3.	Govt. Girls Sec. Sch. Old airport Rd	Girls Only	50
4.	Govt. Girls Day Sec. Sch. Minna	Girls only	50
5.	Girls Day Sec. Sch. Kontagora	Girls only	50
Total			250

Discussion of the Findings:-

The study's two research questions were answered in a descriptive manner.

What factors influence female students' choice of science topics, according to research question 1?

Table 1:- A percentage analysis of the elements that influence students' scientific topic choices.

S/N	Factors Influencing Female Students' Choice of Science Subjects	Responses			
		Yes		No	
		F	%	F	%
1	Ability	195	81.3	45	18.7
2	Intelligence	201	83.8	39	16.2
3	Aptitude	168	70.0	72	30.0
4	Interest	214	89.2	26	10.8
5	Value	156	65.0	84	35.0
6	Personality	166	69.2	74	30.8
7	Family background	159	66.3	81	33.7
8	School type	151	62.9	89	37.1
9	Peer group	174	72.5	66	27.5
10	Cost of training	179	74.6	61	25.4
11	Period of training	145	60.4	95	39.6
12	Parents' income	163	67.9	77	32.1
13	Availability of instructional materials	198	82.5	42	17.5
14	Teachers' quality	167	69.6	73	30.4
15	Religion	99	41.3	141	58.7

Item 1 of table 1 found that 81.3 percent of respondents agreed that ability influenced female students' choice of science disciplines, while 18.7 percent disagreed. Item 2 revealed that 83.8 percent of respondents agreed that intelligence influences female students' choice of science subjects, while 16.2 percent disagreed; item 3 revealed that

70.0 percent of respondents agreed that aptitude influences choice of science subjects, while 30.0 percent disagreed; and item 4 revealed that 89.2% of respondents agreed that interest influences choice of science subjects, while 10.8% disagreed. Item 5 revealed that 65.0 percent of respondents agreed that value influenced scientific subject choice, while 35.0 percent disagreed. Item 6 revealed that 69.2% of respondents agreed that personality influenced scientific subject choice, while 30.8 percent disagreed. Item 7 revealed that 66.3 percent of respondents agreed that family history influenced scientific subject choice, while 33.7 percent disagreed. Item 8 revealed that 62.9 percent of respondents agreed that the style of school influences science subjects chosen, while 37.1 percent disagreed. According to item 9, 72.5 percent of respondents believed that peer group influences science subject choice, whereas 27.5 percent disagreed. Item 10 revealed that 74.6 percent of respondents agreed that training costs influence science subject choice, while 25.4 percent disagreed. Item 11 revealed that 60.4 percent of respondents agreed that training period influenced science subject choice, while 39.6 percent disagreed. Item 12 revealed that 67.9% of respondents agreed that their parents' money influenced their children's choice of science disciplines, while 32.1 percent disagreed. Item 13 revealed that 82.5 percent of respondents agreed that instructional resources availability influenced science subject choice, while 17.5 percent disagreed. Item 14 revealed that 69.6% of respondents believed that teacher quality influenced female students' choice of science disciplines, while 30.4 percent disagreed. Item 15 revealed that 41.3 percent of respondents agreed that religion influenced science subject selection, while 58.7% disagreed. As a result, high percentages were found for factors such as ability, intelligence, aptitude, interest, value, personality, family background, school type, peer group, cost of training, period of training, parents' income, availability of instructional materials, and teachers' quality, while religion had low percentages.

Question 2: Do occupational counselling services help students keep their interest in science?

Table 2:- Percentage analysis demonstrating the importance of vocational counselling services in maintaining female students' interest in science subjects.

S/N	Vocational Counselling Services that Sustain Female Students' Interest	Responses			
		Yes		No	
		F	%	F	%
17	Orientation service	189	78.8	51	21.2
18	Individual inventory service	167	69.6	73	30.4
19	Information service	178	74.2	62	25.8
20	Counselling service	202	84.2	38	15.8
21	Placement service	198	82.5	42	17.5
22	Referral service	156	65.0	84	35.0
23	Remedial service	142	59.2	98	40.8
24	Follow-up service	176	73.3	64	26.7
25	Research service	128	53.3	112	46.7
26	Evaluation service	137	57.1	103	42.9
27	I am exposed to vocational counselling services	56	23.3	184	76.7

According to item 17 in table 2, 78.8% of respondents believed that orientation service keeps female students interested in science courses, while 21.2 percent disagreed. Item 18 found that 69.6% of respondents felt that individual inventory service keeps female students interested in science courses, while 30.4 percent disagreed. Item 19 found that 74.2 percent of respondents believed that information services keep female students interested in science courses, while 25.8% disagreed. Item 20 found that 84.2 percent of respondents believed that counselling services help female students maintain their interest in science courses, while 15.8% stated no. Item 21 found that 82.5 percent of respondents agreed that placement services keep female students interested in science, while 17.5 percent disagreed. Item 22 found that 65.0 percent of respondents agreed that referral services keep female students interested in science, while 35.0 percent disagreed. Item 23 found that 59.2% of respondents believed that remedial services keep female students interested in science courses, while 40.8 percent disagreed. Item 24 found that 73.3 percent of respondents agreed that follow-up service keeps female students interested in science, while 26.7 percent disagreed. Item 25 found that 53.3 percent of respondents believed that research service encourages female students to pursue science disciplines, while 46.7 percent disagreed. Item 26 found that 57.1 percent of respondents believed that evaluation services keep female students interested in science, while 42.9 percent disagreed. Item 27 found that 23.3 percent of respondents agreed or strongly agreed that they are exposed to vocational counselling services, while

76.7 percent responded no. As a result, it was clear that the students' experience to vocational counselling services was relatively limited.

Conclusion and Summary:-

The research revealed that ability (81.3 percent), intelligence (83.8 percent), aptitude (70.0 percent), interest (89.2 percent), value (65.0 percent), personality (69.2 percent), family background (66.3 percent), school type (62.9 percent), peer group (72.5 percent), cost of training (72.5 percent) are the factors responsible for the choice of science subjects among female students in Tafa local government area of Niger State. According to the respondents, the main reason for female students' inadequate enrollment in science subjects is their aptitude (81.3 percent), particularly in science-related subjects. The availability of instructional resources (82.5%) and intelligence (83.8%) are the two factors that drive the teaching and learning of science courses.

On the contrary, the study found that religion (41.3 percent) has little influence on pupils' choice of science disciplines in Niger State's Tafa Local Government Area.

To answer the second research question: Do vocational counselling services in Niger State's Tafa Local Government Area sustain students' interest in science subjects? According to item 17 in table 2, 78.8% of respondents believed that orientation service keeps female students interested in science courses, while 21.2 percent disagreed. Item 18 found that 69.6% of respondents felt that individual inventory service keeps female students interested in science courses, while 30.4 percent disagreed. Item 19 found that 74.2 percent of respondents believed that information services keep female students interested in science courses, while 25.8% disagreed. Item 20 found that 84.2 percent of respondents believed that counselling services help students maintain their interest in science courses, while 15.8% stated no. Item 21 found that 82.5 percent of respondents agreed that placement services help students maintain their interest in science courses, while 17.5 percent disagreed. Item 22 found that 65.0 percent of respondents agreed that referral services help students maintain their interest in science courses, while 35.0 percent disagreed. Item 23 found that 59.2 percent of respondents believed that remedial services help students maintain their interest in science courses, while 40.8 percent disagreed. Item 24 found that 73.3 percent of respondents believed that follow-up service helps students maintain their interest in science courses, while 26.7 percent disagreed. Item 25 found that 53.3 percent of respondents agreed that research service keeps students interested in science, while 46.7 percent disagreed. Item 26 found that 57.1 percent of respondents believed that evaluation services help students maintain their interest in science courses, while 42.9 percent disagreed. Item 27 found that 23.3 percent of respondents agreed or strongly agreed that they are exposed to vocational counselling services, while 76.7 percent responded no. As a result, it was clear that the students' experience to vocational counselling services was relatively limited.

Recommendations:-

Based on the data, the following advice is given to increase female child enrolment in sciences and to stimulate technological growth.

Because there is a scarcity of science-related instructional materials in schools and little information available to students about why they should study science subjects, students should be given adequate science teaching aids and information about science subjects to encourage them to pursue science subjects.

All stakeholders in education should identify and play their various roles in motivating, influencing, and supporting students who study science subjects. As the study demonstrates, it should not be left just to instructors.

To improve the proper application of scientific teaching and learning pedagogy, qualified and certified teachers should be employed to handle all science topics and science-related disciplines.

Because access to counselling services, such as orientation services and the like, influences and sustains female students' interest in science subjects, I recommend that the government, through its ministry of Education and supervisory agencies, ensure the functionality of counselling services in schools, because the research revealed that students' exposure to vocational counselling services was very low.

Educational measures that promote the education of girls should be implemented.

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