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Influence of Students' Factors on the Enrollment of Female Students in Science Oriented Courses In Nigeria Higher Institutions

MADUME, Ingrid Omenihu

Department of Science Education,
Faculty of Education,
Rivers State University, Port Harcourt, Rivers State, Nigeria
omechuck@gmail.com

ABSTRACT
This study investigated the influence of students' factors on the enrollment of female students in science oriented courses in Nigerian higher institutions. The descriptive survey research design was adopted for the study with a study population which consisted of all the female students enrolled in science based courses. A two-staged sampling procedure was adopted to select a sample size of 161. The instrument for data collection was a structured questionnaire with a reliability coefficient of 0.70. Data was analyzed using percentage, mean and Chi-square. The result of the study showed that, there was a significant association between performance of female students and their enrolment in science based courses ($x^2 = 77.544$, df = 2, P = 0.0000). All the socio-economic factors considered in the study affected the rates of enrolment of female students in Science based courses ($P < 0.05$). It was concluded that, the socio-economic factors such as father's levels of income, number of siblings and income of the parents were the main socio-economic factors affecting the enrolment in Science based courses among the female students. Recommendation made among others was that, the government should subsidize the schooling fee for females in the State, especially those going for science based courses.
Keywords: Enrollment, Females, Students, Science Courses.

INTRODUCTION

The composition of female studies has been growing all over the world. The trend seems to indicate that female students prefer some courses over others. Female students who enroll in postgraduate courses do so for a number of reasons which range from the desire for high income or better employment, empowerment for decision reasons and other social cultural factors. This trend is also typical in Technical training institutions (Wattles, 2009). It was a common practice in the old days in the United States of America and Europe and Africa to find feudalism converting it into a family affair where the son of a blacksmith was destined to become a blacksmith and a feudal was born a leader. Industrialization and post industrialization has made it possible for a common person to be richer as long as she or he has due skills and knowledge (Wattles, 2009). Today, one has not only to make due career planning but also exhaustive career research before making a career choice so as to adjust with the evolving socio-economic conditions (Wattles, 2009). According to Littleton and Baninert (2009), course enrolment is influenced by multiple factors including personality, interests, self-concept, cultural identity, globalization, socialization, role model, social support and available resources such as information and financial.

According to Hewitt (2010), factors influencing career choice can either be intrinsic or extrinsic or both. Hewitt further states that most people are influenced by careers that their parents favour, others follow the careers that their educational choices have opened for them, some choose to follow their passion regardless of how much or little it will make them while others choose the careers that give high income. Students perception of being suitable for particular jobs also has

been found to be influenced by a number of factors including ethnic background, year in school, level of achievement, choice of science subjects, attitudes and differences in job characteristics (McQuaid & Bond, 2003). Bandura et al (2001) state that each individual undertaking the process is influenced by several factors including the context in which they live in, their personal aptitudes, social contacts and educational attainment. In a study by Perrone, (2001) on role model influence on the career decisiveness of college students, it was found that role model supportiveness, and quality of relationship contributed to the career choice of students. The same study indicated that majority of the students selected same gender role models. A number of studies carried out in African countries have provided data that illustrated the gross under representation of females in Science subjects and careers (FAWE, 2019). The Forum for of African Women Educationists (FAWE, 2019), acknowledged that in many African states, girls were still restricted to studying what is perceived to be "soft option" Subjects, which has limited their access to scientific and technical disciplines in institutions of higher learning.

In Nigeria, it was reported at a workshop organized by Nigeriatta University and the World Bank, on gender main-streaming in public universities, that although gender disparities in students' enrolment exist at all levels of higher education, they are particularly wide at higher degree levels especially in sciences, with special reference to mathematics and technical disciplines. It was also reported that women academicians were concentrated in what is perceived as traditional female social science and education disciplines (Ramani, 2004). In a study by Natalie (2006), young adults were influenced through interaction with the context of family, school and community as they learn about and explore careers which ultimately lead to their career choice. One consistent finding in research suggests that adolescents' own aspirations are influenced by their parent's aspirations or expectations. Parental support and encouragement are important factors that have been found to influence career choice. Children may choose what their parents desire simply to please them (Taylor et al, 2004).

Generally, the choice of a career could be influenced by the student's socio-economic status, parents, friends, and counselors. According to Oyamo and Amoth cited in Ohadoma (2011), studies in Nigeria show that parents more than teachers play a major role in the career choice of students. In Nigeria, every year secondary school students make their career choices before sitting for their final Nigeria Certificate of Secondary Examination. The result of this final examination determines who joins university since admissions into various careers were determined by grades obtained from the Nigeria Certificate of Secondary Education and JAMB score. Before making their subject choices, students are often provided with a list of careers from which they are supposed to make choices. Most of the students lack adequate information regarding various careers hence the choices that they make are embedded in their perception of the ideal job and the subjects they study in secondary school. The only support students get within the school is from career masters or counselors as they are mostly refereed to and the teachers who are expected to support students in their career choice. However, one major consideration is the socio-economic status of the students. For instance, female students who may have plans originally to study medicine, divert to other courses probably because of lack of resources. Though, the socio-economic status notwithstanding, some parents feel training the female child is a waste of resources as she may likely to change her identity to that of her husband and even to enrich her husband rather than the parents who have suffered to train her. Thus, it becomes imperative to investigate the influence of students' factors on the enrollment of female students in science oriented courses in Nigerian higher institutions.

Objectives

The following objectives were stated to guide the study:

1. To find out the social-economic background of the female students enrolled in Science-based courses in tertiary institutions in Nigeria.
2. To investigate how students factors influence their enrolment in Science-based courses in tertiary institutions in Nigeria.

Research Questions

The following research questions were answered in the study:

1. What is the social economic background of female students enrolled in science- based courses in tertiary institutions in Nigeria?
2. What female students' factors influence their enrolment in science-based courses in tertiary institutions in Nigeria?

METHODOLOGY

The descriptive survey research design was adopted for the study with a population which consisted of all the female students enrolled in science based courses in the tertiary institutions in Nigeria at the time of the study. The sample size for the study was one hundred and sixty-one (161). A two-staged sampling procedure was adopted which included the use of the simple random sampling technique at the first stage to select ten institutions .and systematic random sampling technique at the second stage to get a sample of 161 students from the sampling frame of students in each institution. The instrument for data collection in the study was a structured questionnaire with a reliability coefficient of 0.70. Data was collected from female students pursuing Science-based courses. The data was collected by the researcher with the help of one research assistant. Data was analyzed using descriptive statistics such as percentage and mean while inferential statistics such as Chi-square was used at 0.05 level of significance.

RESULTS

The results and findings of this study were presented below in tables and figures:

Table 1: Performance rating of the students based on the past examination scores

Rating	Frequency	%	Percentage likely to enroll	Chi-square (x^2)	df	P-value
Good	62	44.6	97.8	77.544	2	0.0000
Average	44	32.2	67.0			
Poor	32	23.2	32.3			

The role of performance in enrolment in Science based courses was determined. The female students were asked whether they performed well and the results as summarized below in Table 1. When the performance of the female students were cross-tabulated with the probability of enrolment in Science based courses, it was established that there was a significant association between performance and enrolment ($\mathbf{x^2}$ = 77.544, df = 2, P = 0.0000).

Table 2: Effects of the father's levels of education on enrolment in Science based courses among female students in the tertiary institutions

Fathers level of education	Frequency	%	Probability of enrolment	Chi-square (x^2)	df	P-value
None	44	32.4	72.7	109.3	4	0.0000
Primary	43	31.6	72.2			
Secondary	37	27.2	89.2			
College	9	6.6	88.9			
University	*I*	2.2	100.0			

Table 2 provides information on the effects of the father's level of education and probability of enrolment in Science based courses. Majority of the students father's had no education (32.4%) similar to the percentage with only primary level of education (31.6%) while female students fathers with college and university education were only 6.6% and 2.2% respectively. The researcher cross-tabulated the female students father's levels of education and the probability to complete and analyzed the relationship. The statistical analysis revealed that there was a significant relationship between students' father's level of education and enrolment in Science based courses among the female students ($P < 0.05$). Female students with the highest probability of enrolment in Science based courses were

those whose fathers had college or university levels of education at 88.9% and 100% respectively. On the other hand, female students whose fathers had no education had lower probability to complete (72.7%) similar to the percentage of female students whose father's had primary level of education.

Table 3: Effects of the number of siblings on the probability to complete education among female Science based courses students

Number of Siblings	Frequency	%	Percentage likely to enrolment	Chi-square (x^2)	df	P-value
< 2	31	22.8 •	83.9	18.543	3	0.0022
3-5	67	49.3	80.6			
6-10	34	25.0	73.5			
>10	4	2.9	25.0			

This study also determined the relationships between the number of siblings and probability of enrolment in Science based courses among the female students in Science based courses (Table 4.12). Up to 49.3% of the female students had number of siblings ranging from 3-5 followed by female students with 6-10 siblings (25%) and least number of females had over 10 siblings (2.9%). The probability to complete college education was found to be high among students with less than 2 siblings (83.9%) followed by those with 3-5 siblings (80.6%) and least among those with over 10 children (25%). When the number of siblings was cross-tabulated with the probability to complete, it was established that there were significant relationships between number of siblings and probability to complete ($P < 0.05$). Generally, the relationships were such that increasing number of siblings resulted in decreasing probability of completing college students among the females' students.

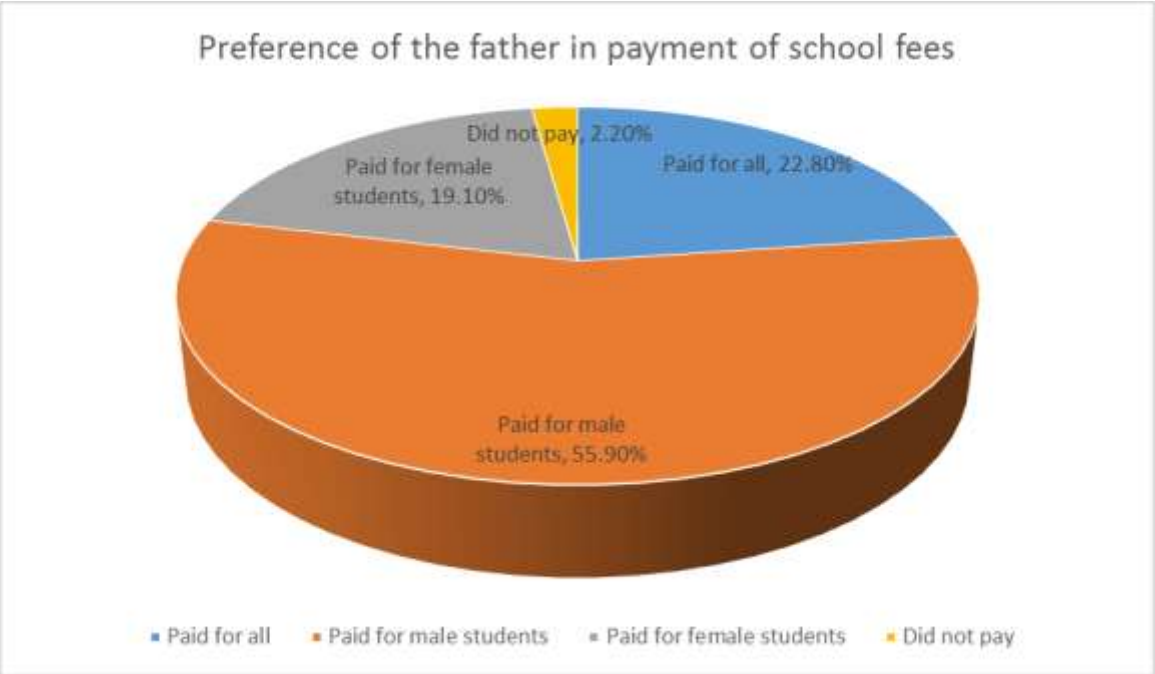

Fig 1: Preference of the father in payment of school fees to the siblings

The researcher inquired from the female students how many siblings their father paid school fees for and whether they were female students or male students. The female students parents preferred to pay fees for male students as attested by two thirds of the

respondents while only one fifth of the female students believed that their parents preferred to pay fees for them.

Table 4: Statements concerning female students' perception towards enrolment in Science based courses of Science based courses due to the socio-economic factors

Statement	SA	A	U	D	SD	Rank score	x^2-value	P-value
My parents were poor	91	25	10	8	2	88.7	12.227	0.0097
Parents preferred to educate male students than female students	51	35	9	32	9	72.8	15.222	0.0074
My family was polygamous	37	36	23	26	14	68.2	29.343	0.0004
My parent's income was low	87	13	15	13	8	83.2	23.443	0.0043
My parents has no formal employment	87	25	15	7	2	87.6	14.543	0.0054
It is not conducive to study at home	10	8	20	39	59	41.0	47.998	0.0000
My father considers me a financial burden	53	41	31	9	1	79.6	33.445	0.0043

The researcher consolidated and rank the information that captured the overall socio-economic background characteristics that influence enrolment in Science based courses rates of the female students in tertiary level colleges. Several information was sought from the female students and the summary was provided in Table 4. According to the table, many female students were unlikely to enrolment due to poverty; preference by the parents to education male students, cultural norms such as polygamy, high illiteracy among the parents while early marriages was not a major cause of female students' enrolment. When the socio-economic status was cross- tabulated with probability to complete, the results indicated that all factors affected enrolment in Science based courses rates ($P < 0.05$).

Table 5: Female students' perception of the Science based courses course and the overall rank scores

Statement	SA	A	U	D	SD	Rank score
I enjoy my course of Science courses at the college	86	21	21	6	2	86.9
I am sure I am good at learning Science based Course	51	21	20	33	11	70.0
Knowing Science courses will help me earn a living	73	36	13	11	3	84.3
I don't think I could do advances Science courses	87	13	17	11	8	83.5
Science courses will not be important to me in my life's work.	85	22	22	- 5	2	86.9
Males are not naturally better than female in Science courses.	71	8	23	11	23	73.7
Getting a teacher to take me seriously in Science courses is a problem	31	23	27	32	23	61.0
Science courses is hard for me	51	32	32	12	9	75.3
I need Science courses for my future work.	63	41	22	6	4	82.5
I am sure of myself when I do Science courses	96	11	8	8	13	84.9
Don't expect to use much Science course when I get out of School	63	41	22	6	4	82.5
Women can do just as men in Science courses	96	11	8	8	13	84.9
Hard to get Science courses teachers to respect	23	51	20	31	11	66.5
Science courses is a worthwhile, necessary subject	63	41	22	6	4	82.5
I would have more faith in the answer for the Science courses problem solved by a man than a woman	96	11	8	8	13	84.9
I am not the type to do well in Science courses	23	51	20	31	11	66.5
My teachers have encouraged me to study more Science courses	47	45	23	13	8	76.2
Taking Science courses is a waste of time	51	17	36	11	21	69.7
I have a hard time getting teachers to talk seriously with me about Science courses	63	41	22	6	4	82.5
Science courses has been my worst subject	96	11	8	8	13	84.9
My teachers think more advanced Science courses were a waste of time for me	23	51	20	31	11	66.5
Women certainly are smart enough to do well in science courses	47	45	23	13	8	76.2
I can get good grades in Science courses	51	17	36	11	21	69.7

The overall attitudes of the female students towards Science based courses and die probability to complete are depicted in Table 4.17. Majority of the female students had positive attitudes (58.9%) towards Agricultural Science based Course. Female students with negative attitudes towards Science based courses were moderate in proportion (33.5%), however, the proportion of students with neutral attitudes were the lowest (7.6%) compared to the other two attitudinal categories. The researcher cross-tabulated the attitudes and probability of enrolment in Science based courses among the students. It was established that there was a significant association between perception and probability to complete with more students having positive perception likely to enrolment than those with negative perceptions (x^2 = 76.4343, df = 2, P = 0.0035).

DISCUSSION OF FINDINGS

A number of reports and research available indicated that the probability of the female students to complete schooling is intricately tied to their socio-economic backgrounds (UNESCO, 2003). According to this study, dropout rates was affected by the family socio-economic backgrounds, socio-culture in* the family and literacy levels of the parent. The rise in the level of poverty in Nigeria (Nigeria National Bureau of Statistics, 2010). The report indicated that 46.8% of Nigerians live below the poverty line and that poverty is one of the major factors, which discourage parents from investing in their children's education. The highest dropout rates were found among children from poor households, The finding of the study showed that, majority of the female students were aged between 18-25 years. The chances of dropping enrolment in Science based courses reduced with age of the female students.

In this study it was also established that parents had many children to take care of and therefore preferred to educate male students resulted in slackening education opportunities for female students and this contributed to the female students drop out rates from secondary schools. Raju (1973) argues that the difficulty of finding money to pay for the education of sons and daughters is the main reason for the premature withdrawal of students from school. The situation where parents have negative attitudes towards education of the girl child or do not see its immediate benefits, the consequence is a high drop-out rate or poor performance for those female students still in school. Social-cultural and religious factors, such as initiation ceremonies and gender socialization, are additional factors responsible for pupils' failure to compete effectively in schools with other children.

The finding of the study showed that, for most of the female students, their father's levels of education were none, primary or secondary education and the chances of the female students completing increased with their father's levels of education. Another important factor that is often related to drop out in Nigeria was parental education level in concurrence with earlier studies. It was widely believed that low parental education is likely to compromise the parents to prioritize education of their children because they see no benefits in education (Niu, & Tienda, 2008). However, contrary arguments have ascertained that parents with very low educational backgrounds are likely to force their children to go to school and perform well in the hope that the children will help them in future. So the children go to school with parental baggage and see themselves as future helpers of their parents and in the process, they develop negative attitudes towards schooling. If they do, they tend to drop out in greater numbers and engage in more income generating activities than children of parents with high levels of education. A case study of rural villages in Nigeria showed parental illiteracy was associated with low household income as factors likely to cause female students to drop out. This move has made it difficult for parents and communities to support education adequately; consequently, education is now beyond the reach of many households. This is mainly due to poverty levels, which have been rising in this country.

The result on the monthly income of the female students' fathers indicated that majority of the female students parents earned below ₦5,000 per month and the chances of the female students completing was calculated to increase with increasing father's income. If children do attend education, changes in the financial situation of parents, as reflected by the volatility of family income, may push some children out of education. The increased level of poverty makes parents unable to feed their children properly and provide adequate health services. In these circumstances, children whose parents cannot afford costs of instructional materials, school uniforms, tuition fees, and activity fees tend to go to school irregularly and, in the long run, drop out of school or have problems during the entire learning process in the school. Faced with limited resources, and reduced returns from education, parents are not only unable but also unmotivated to educate their children. In the end, these factors have negative effects on children's school participation and the overall performance of students in many subjects in school.

The attitude of female students toward a programme affects the way the programme is implemented and how they view the staff. The perception by most of the employers was negative one as attested to by the employments structure. This indicates that there must be some form of problems in the ways the Science based courses from the local tertiary level colleges perform their job. One way that has been highlighted was that the social Science based courses are to theoretical oriented to perform any meaningful practical jobs. The practical aspect of the jobs can however be done by most of the college trained Science based courses who happen to be viewed in favourable light because they also

demand less pay (Orodho, 2005). Majority of the student attested that even though they were trained in Science based courses they had negative perceptions about their competence in industrial job market. This created a negative perception where most of the employers did not prefer employing locally trained Science based courses due to their perceived low outputs from these students. They further indicated that outputs from the college trained Science based courses were much superior than the local trained Nigerian Tertiary level colleges Science based courses.

CONCLUSIONS

Based on the findings of the study, it was concluded that, the socio-economic factors such as father's levels of income, number of siblings and income of the parents were the main socio-economic factors affecting the enrolment in Science based courses among the female students. The perception of the female towards Science based courses was generally positive and many opted for the course because they had confident in it.

RECOMMENDATIONS

Based on the foregoing discussion of the findings and conclusion, the following recommendations were made:

1. The government should subsidize the schooling fee for females in the State, especially those going for science based courses.
2. Parents should give birth to only the number of children they can cater for so as to avoid victimizing the females in a bit to satisfy the males due to low socio-economic status.
3. The female students also, should make deliberate effort to have confidence in themselves and their ability to successfully complete any science course.
4. The tertiary institutions should always organise exchange programmes between themselves and students from the tertiary level colleges in an open discussion and practical learning forum to enhance the practical skills in the Science based courses.

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