

Comparative Study of Male and Female Students' Performance in Science Laboratory Technology, Rivers State Polytechnic, Bori, Nigeria (A 5 year Case Study).

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Abstract

The controversial discussion on the topic of gender and academic performance in sciences has stirred up much debate. It has been reported that gender difference in enrolment in advance mathematics course is influenced by perceived value of competence. It has been proposed that very few women have been found in graduate programs and professions in computer sciences, physics and technology. These courses, along with chemistry and biological sciences, make up the Science Laboratory Technology department in Rivers State Polytechnic. This research therefore seeks to find the relationship between gender and performances in the fields of Science Laboratory Technology in Rivers State Polytechnic, Bori, Nigeria. For the purpose of this study, a descriptive survey method was used. Secondary data in form of students' results for the past five years was obtained from the Exams and Records department of Rivers State polytechnic. Enrolment, performance and graduation trends based on gender and courses offered were investigated at both the National Diploma and the Higher National Diploma levels. The result showed that enrolment of female students is higher in both National Diploma and Higher National Diploma levels, an average of 61.9% and 62.4% respectively of total enrolment, within the period under study. At the National Diploma and Higher National Diploma levels, 38.1% and 37.8% enrolment was recorded for the males respectively. Analyses of performance did not show any noticeable gender bias. Graduation ratio was significantly higher for female students when compared to their male counter parts.

Keywords: Gender, Science Laboratory Technology, Performance, Enrolment, Graduation, Female students, Male students.

1. INTRODUCTION

Science Laboratory Technology is considered an essential component in the drive towards vision 20:20:20 in Nigeria. The United Nations has noted that technical education is key to global reform (UNESCO, 2004). The World Bank lending program gives priority attention to technology focused education because of its capacity to meet the need of societies to become globally competitive. The role of Science Laboratory Technology in national development is expressed through the provision of job-related learning, research and development opportunities as well as building a competitive workforce (Ojera, 2012).

In the light of these, research on students' performance will provide important data for planning and improvement. However, the gender factor is a key component of concern in line with the all-inclusive development approach proposed by the Nigerian government in recent years. The gender question in the fields of science have been previously ignored due to a long standing hypothesis that scientists have a superior ability to root out gender bias in their laboratories because they are trained to rigorously reject subjective criteria but experimental results have shown this to be wrong in many cases (Dovidio, et al, 2012). The debate on gender and academic performance in sciences has been both controversial and interesting {Linver et al, 2002}. Many have proposed that gender difference in enrolment in certain fields of science, is influenced by perceived value of competence, while others stated that few women graduate from programs and professions in the fields of science and technology.

The department of Science Laboratory Technology (SLT) of Rivers State Polytechnic provides adequate platform for further research. Located in the heart of Niger Delta region of Nigeria, the Rivers State Polytechnic enrolls students for National Diploma (ND) and Higher National Diploma (HND) programmes in the Science Laboratory Technology with options for HND Students in Biology/Microbiology, Chemistry/Biochemistry, and Physics with Electronics.

The objective of this research work is to examine the relationship between gender and enrolment, graduation and performance in the department of Science Laboratory Technology Rivers State Polytechnic, Bori, Nigeria.

2. METHODOLOGY

A descriptive survey method was used. The goal here was to generate factual, accurate and systematic data to be used for statistical analyses (Valdez, 2014). Secondary data in form of students' enrolment and graduation records was obtained from the admissions office, while results/scores were collected with permission from the Exams and Records department of the Polytechnic. Records from 2007/2008 to 2011/2012 sessions were used.

Descriptive Statistics was expressed in graphical forms and then analysed using means and standard deviations at 95% confidence interval. Data was further subjected to Anova tests, which is appropriate for comparing means of different groups (Oladeji, 2011).

Trends based on gender, course, enrolment, graduation and performance over the years of study was analysed.

Results and Discussion
A NATIONAL DIPLOMA

Table 1

TABLE 1: DATA OF MALE AND FEMALE ENROLLMENT IN NATIONAL DIPLOMA (ND) IN SCIENCE LABORATORY TECHNOLOGY.					
SESSION	males	females	TOTAL	% Male	% Female
2007/2008	38	89	127	29.9	70.1
2008/2009	48	83	131	36.6	63.4
2009/2010	88	103	191	46.1	53.9
2010/2011	58	92	150	38.7	61.3
2011/2012	138	234	372	37.1	62.9
TOTAL	370	601	971	38.1	61.9

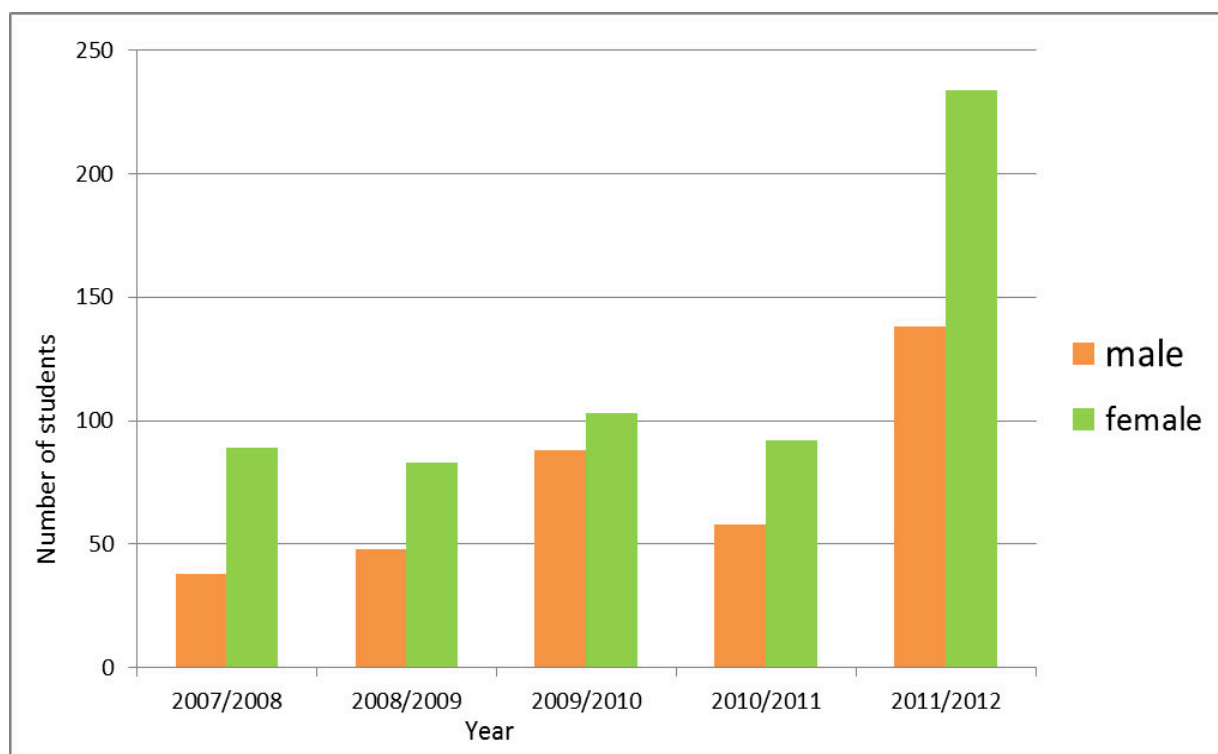


Fig: 1(a) Male and female enrollment in National Diploma (ND) in Science Laboratory Technology.

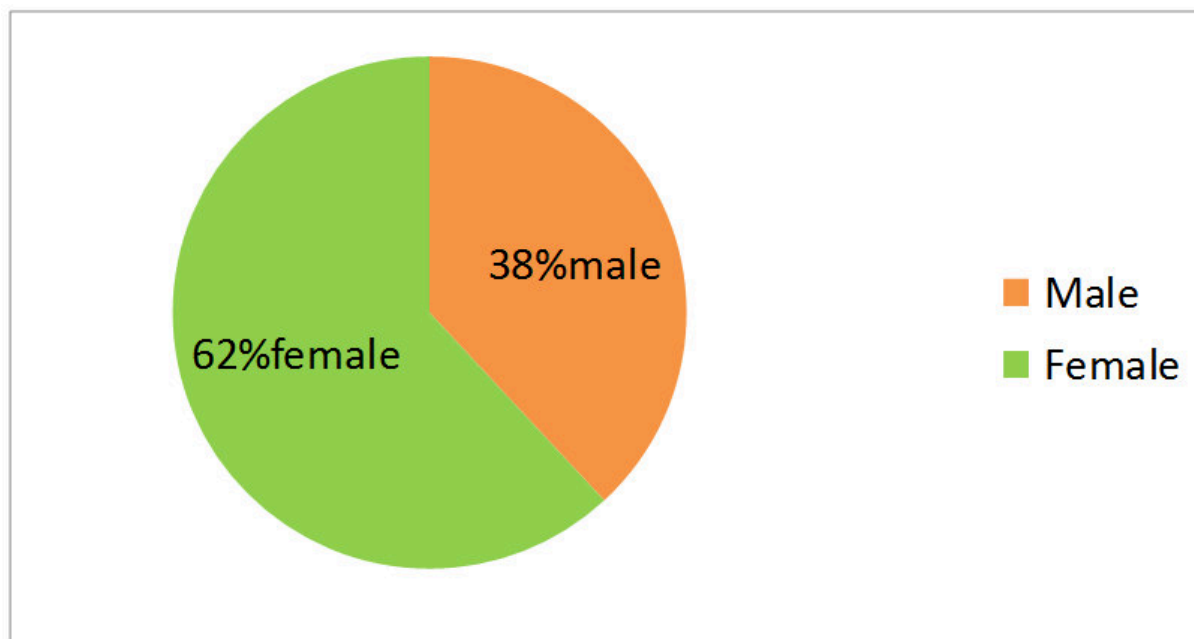


Fig.1 (b): Chart of percentage student enrolment

In table 1, the enrolment into (ND) National Diploma into Science Laboratory Technology shows that the number of females that enrolled for the program is more than the males in each session. The data shows that the number of females is about twice the number of males.

The highest enrolment was recorded in 2011/2012, for the period under review.

In the past five years, a total of 38% male and 62% female have enrolled for the ND program in the department.

Statistical analysis also shows that female enrolment was significantly higher than their male counterparts.

Table 2

DATA ON MALE AND FEMALE PERFORMANCE IN NATIONAL DIPLOMA (ND)					
IN SCIENCE LABORATORY TECHNOLOGY.					
		Distinction	Upper Credit	Lower Credit	Pass
2007/2008	males	0	3	16	2
	females	0	2	34	1
2008/2009	males	1	7	15	2
	females	0	5	14	4
2009/2010	males	1	17	43	2
	females	1	14	71	3
2010/2011	males	0	5	38	4
	females	0	11	73	2
2011/2012	males	4	14	31	0
	females	0	16	81	8

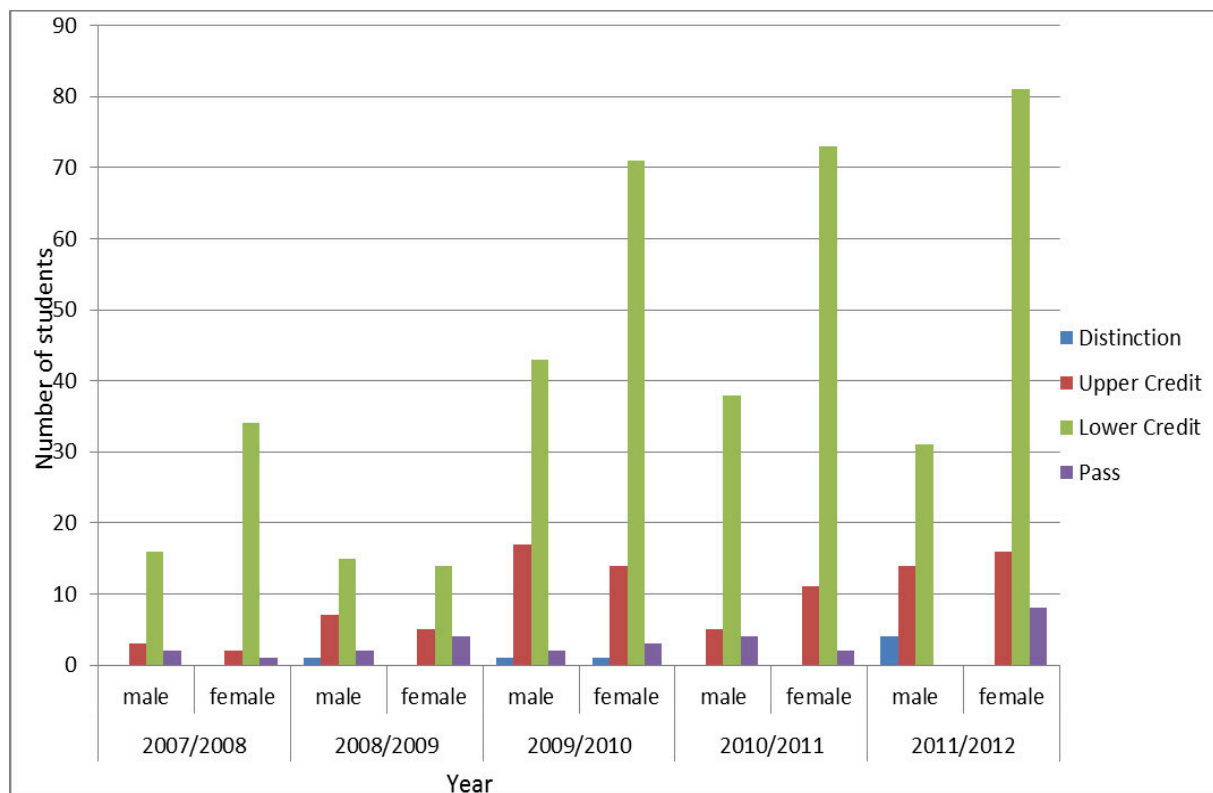


Fig: 2(a) Male and Female performance in National Diploma (ND) in Science Laboratory Technology

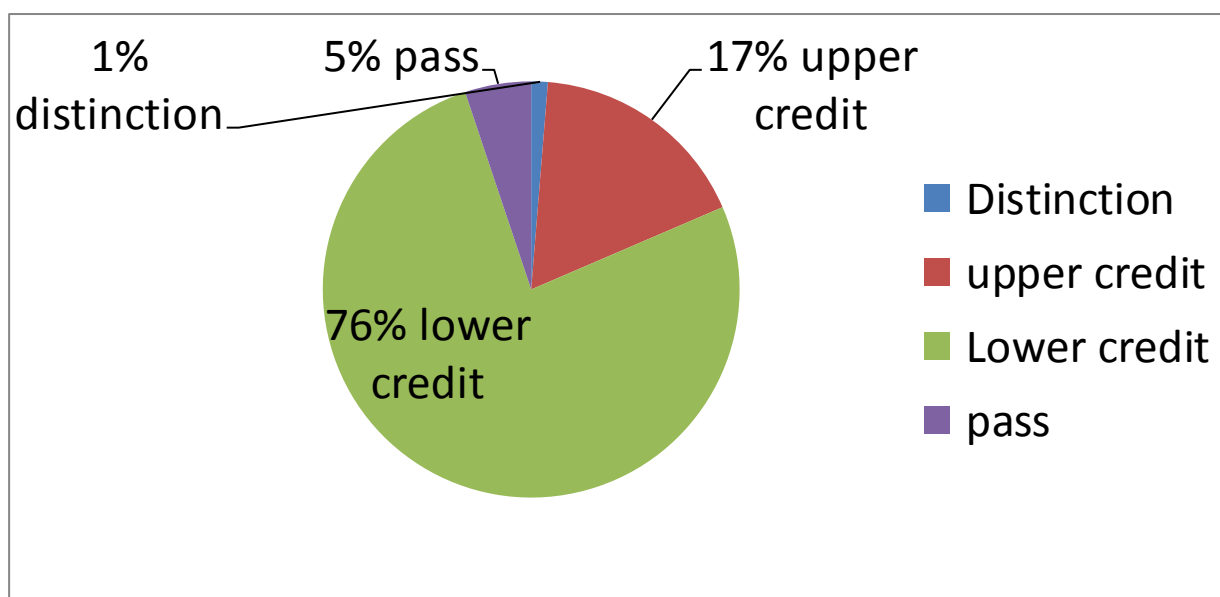


Fig 2(b) Chart of percentage student performance.

The data of male and female performances for the years under study are presented in Table 2. showing different performances in the distribution of the final results with very few students getting a distinction and pass while more students get lower credit and upper credit respectively.

Fig 2(a) shows that more female students graduated with a lower credit grade than the males. Overall performance shows that the males did better in 2010/2011 session for instance, obtaining distinction and upper credit when compared to the females. The female students however had a better overall performance in 210/2011.

Fig 2 (b) shows a chart of the distribution of the students graduation pattern. The different performances in the distribution of the final results shows very few students graduating with a distinction and pass while more students (76%) graduated in lower credit and 17% with upper credit. More males graduated in upper credit through the sessions except in 2010/2011 and 2011/2012 sessions.

Table 3

TABLE 3:					
DATA OF MALE AND FEMALE GRADUATION IN NATIONAL DIPLOMA (ND)					
IN SCIENCE LABORATORY TECHNOLOGY.					
SESSION	male	female	TOTAL	% Graduation	
				Males	Females
2007/2008	21	37	58	55.3	41.6
2008/2009	25	23	48	52.1	27.7
2009/2010	63	89	152	71.6	86.4
2010/2011	47	86	133	81.0	93.5
2011/2012	49	105	154	35.5	44.9
TOTAL	205	340	545	37.6	62.4

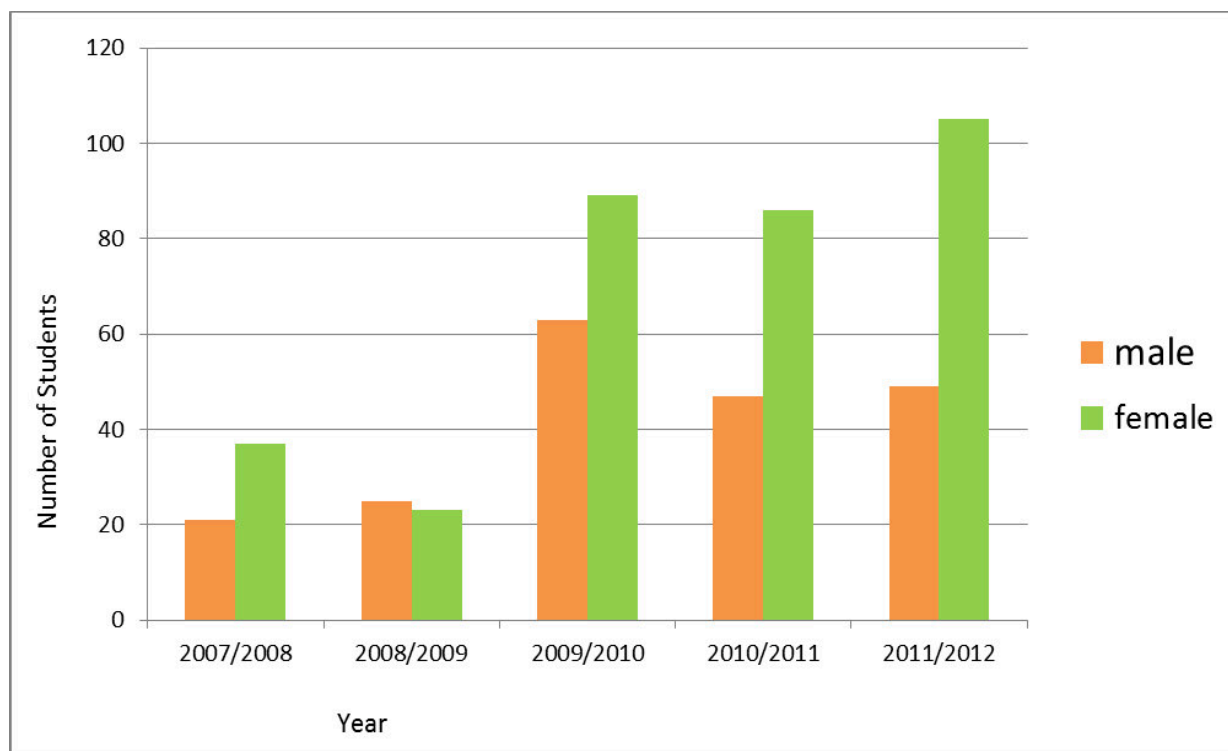


Fig: 3(a). Male and female graduation in National Diploma (ND) in Science Laboratory Technology.

Table 3 shows the number of male and female students who graduated in the various sessions and the graphical presentation is shown in Fig 3(a).

For 2007/2008 session, 21 males graduated out of the 38 males that enrolled for the program. This represents 55.3% while 37 females graduated out of 89 females that enrolled, giving the percentage of female graduates for this session as 41.6%. For the subsequent sessions, more females graduated compared to the males except for 2008/2009 session.

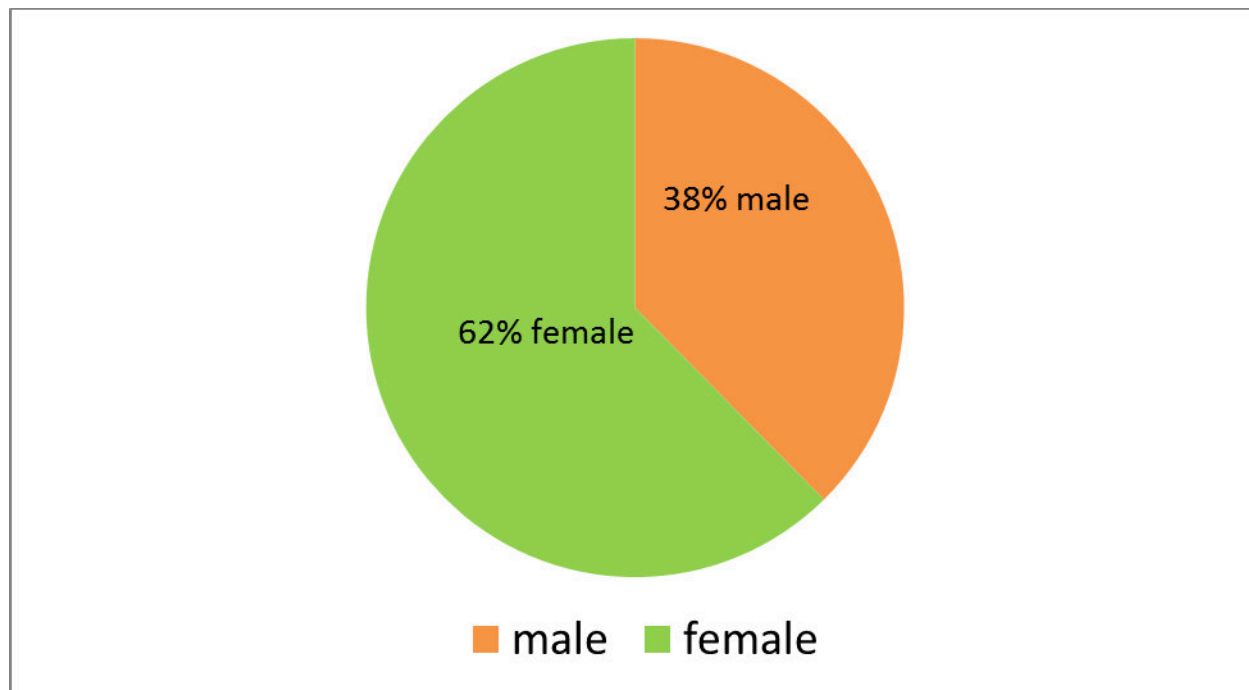


Fig 3(b). Distribution of male and female graduation.

Table 3 also shows the number of students who graduated in ND during the period under review as 545 out of 971 that enrolled (Table 1), showing a 56.1% graduation rate. Out of the 370 male students (Table 1) that enrolled in the programme during the period, under study only 55.4% graduated, while out of the 601 female students that enrolled only 56.6% graduated.

Statistical analysis further confirms that the level of significance between male and female graduation is negligible.

B. HIGHER NATIONAL DIPLOMA (HND)

Table 4

DATA OF TOTAL NUMBER OF MALE AND FEMALE ENROLLMENT IN HIGHER NATIONAL DIPLOMA (HND) IN SCIENCE LABORATORY TECHNOLOGY DEPARTMENT.						
SESSION	male	female	TOTAL	% Males	% Females	
2007/2008	28	8	36	77.8	22.2	
2008/2009	11	13	24	45.8	54.2	
2009/2010	24	17	41	58.5	41.5	
2010/2011	28	18	46	60.9	39.1	
2011/2012	80	46	126	63.5	36.5	
TOTAL	171	102	273	62.6	37.4	

The highest number of males that enrolled for HND program was recorded for 2011/2012 session; 80 males representing 63.5% of the total number of students enrolled for that session. The total number of male students who enrolled rose from 11 (2008/2009) to 80 (2011/2012) while for the female students the total number rose from 8 (2007/2008) to 46 (2011/2012).

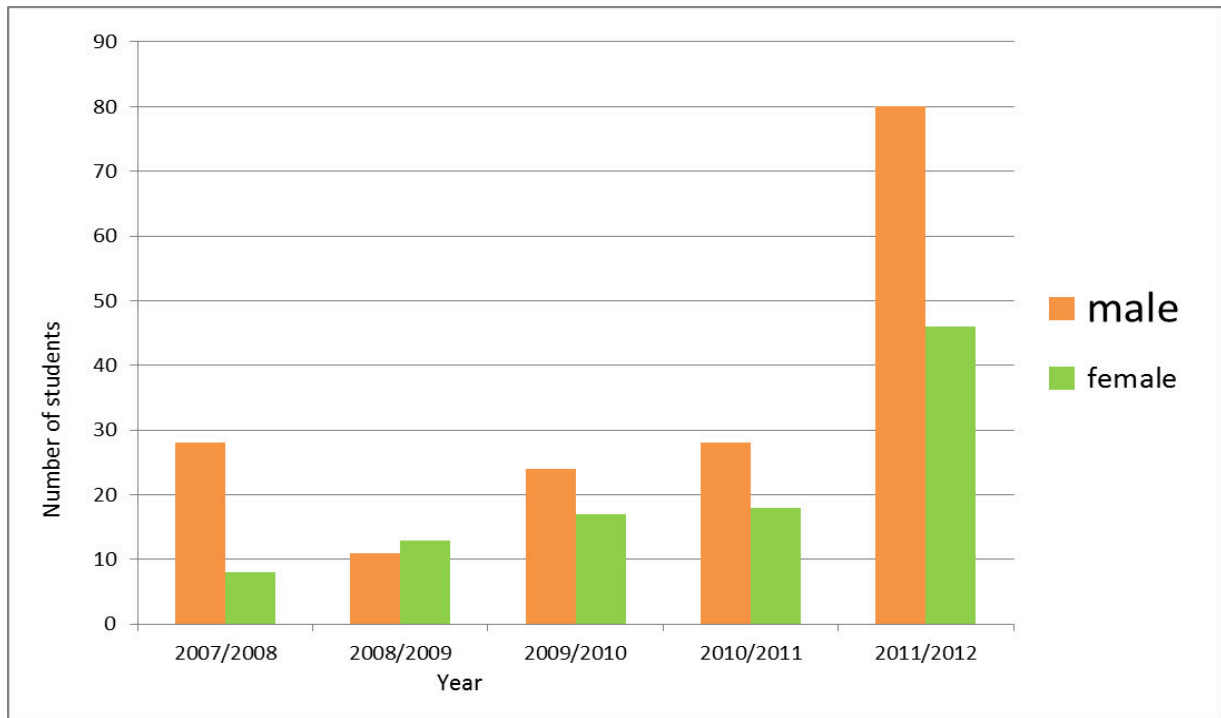


Fig 4(a) Graph of total male and female enrollment in Higher National Diploma (HND) in Science Laboratory Technology.

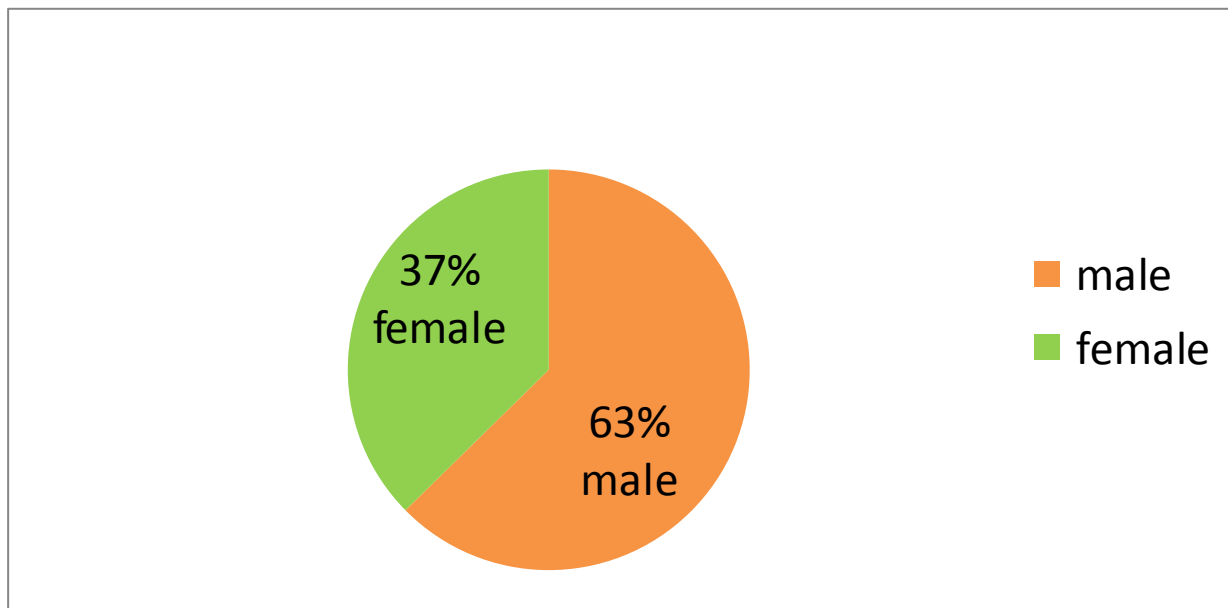


Fig. 4(b): Distribution of male and female enrolment. Students

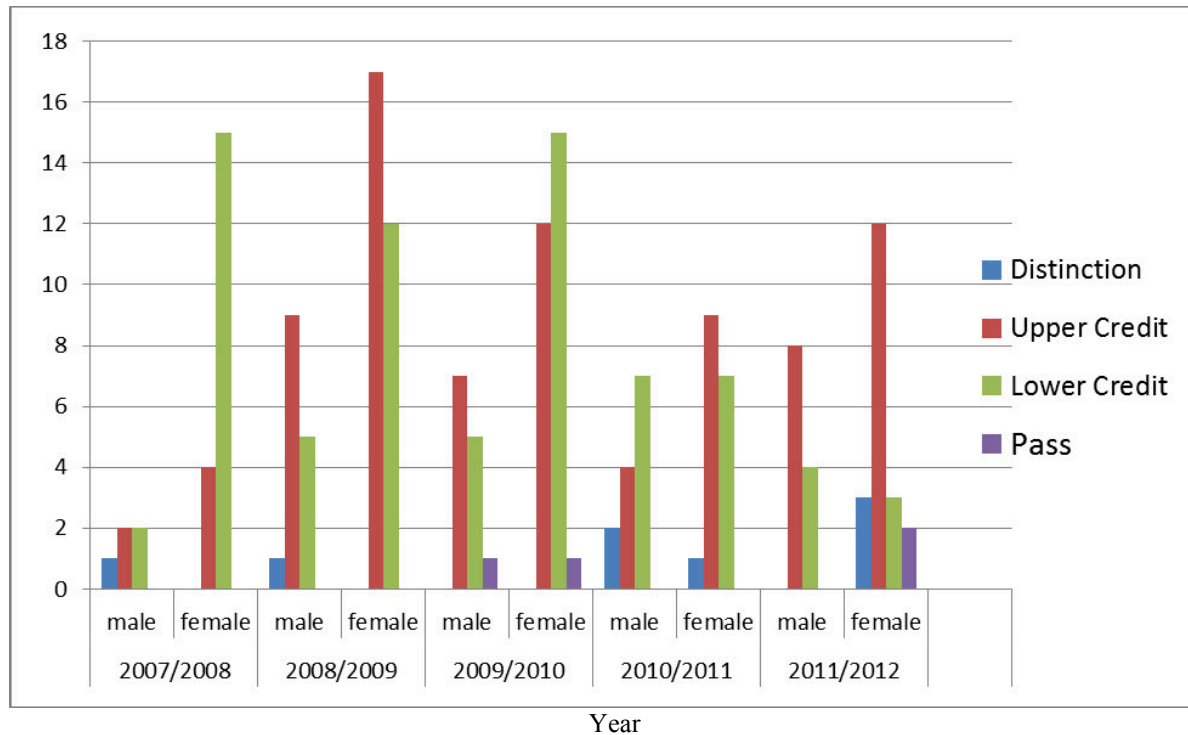


Fig. 6(a) Graph of total male and female graduation and performance.

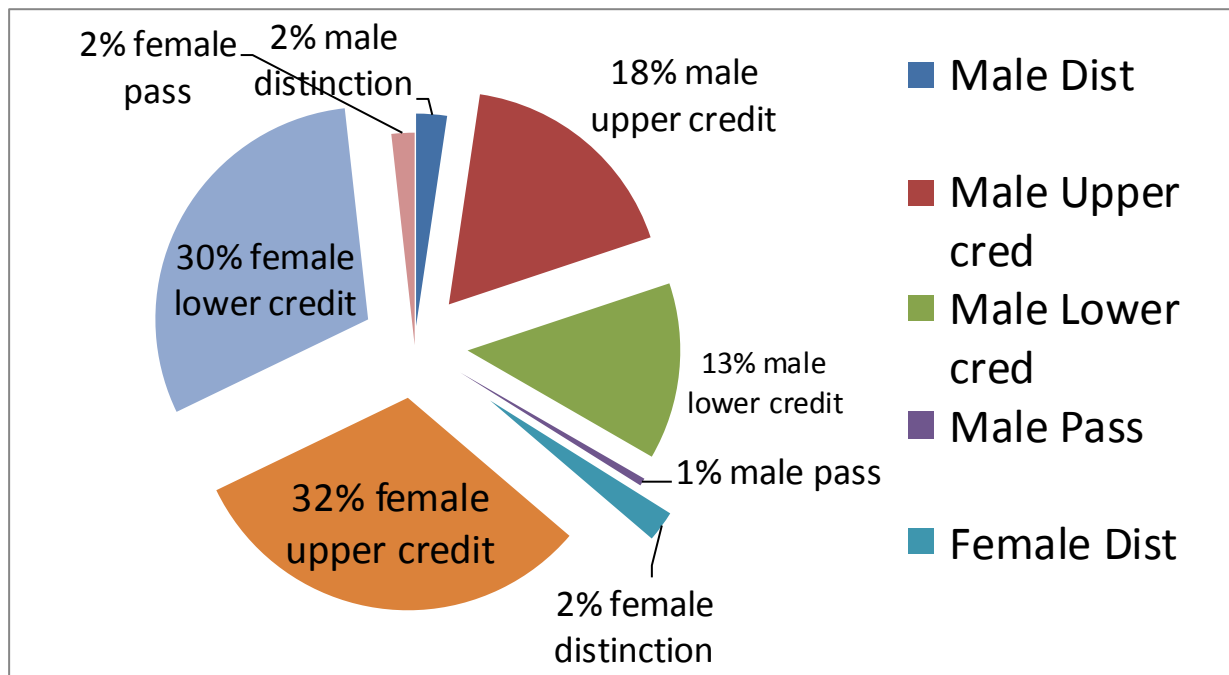


Fig 6(b) Distribution of male and female graduation (HND)

The HND programme recorded a low enrolment. This is presented in Table 4 showing 171 males and 102 females enrolling for HND for the years under review. During the same period, the enrolment showed that more males registered for HND than females, with 2007/2008 and 2011/2012 showing the highest records.

Fig 6(a) and (b) shows a significant performance rate among females, even when they enrolled the least.

Table 6

TABLE 6:						
DATA OF TOTAL MALE AND FEMALE GRADUATION IN HIGHER NATIONAL DIPLOMA (HND)						
IN SCIENCE LABORATORY TECHNOLOGY.						
SESSION	male	female	TOTAL	% Male	% Female	
2007/2008	24	7	31	77.4%	22.6%	
2008/2009	8	13	21	38.1%	61.9%	
2009/2010	23	16	39	59%	41%	
2010/2011	26	16	42	61.9%	38%	
2011/2012	62	40	102	60.8%	39.2%	
TOTAL	143	92	235	60.9	39.1%	

4. CONCLUSIONS

From the analysis of results, findings conclude as follows:-

Gender plays a significant role in student enrolment in the Science Laboratory Technology department. Female enrolment was higher, dispelling suspicions that only few women were found in the Sciences and technological fields of study.

The trend was naturally extended to graduation. It follows also that more female students graduated removing any concern of gender based dropouts.

There is no significant difference between the performance of male and female students over the periods covered in the study.

Whereas gender played a significant role in the choice of enrolment in the science laboratory technology, gender was not a factor in student performance.

Academic superiority/inferiority is NOT gender related.

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