

THE ESSENTIAL THINGS MALE AND FEMALE STUDENTS NEED TO  
KNOW IN ENGINEERING DRAWING FOR EFFECTIVE  
PERFORMANCE

BY

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## Abstract

Engineering drawing is a graphic language that is used universally by design engineers and engineering technologists to describe the shape and the size of structures and mechanisms. It is one of core courses in engineering curriculum as a good student of engineering must do it and this wise the students and teachers have a lot of role to play. Secondary data in form of the results or scores for the past five years were collected from the examination officers of various departments, through the permission of their heads of departments. Essentially, cumulative grade point average (CGPA) of the students was used and these were statistically valued by taking the mean score over a period of five years. The major consideration in this study are on MEC 101 and MEC 102 which are Technical Drawing and Descriptive Geometry as it was concluded that the males are not academically superiors to females and that gender analysis of performance is not on biological differences. It shows that what the male and the female students need is hard work and confidence that they can do any thing when they are thoroughly taught in which the students and the teachers have a role to play as work it in the studio and assessing it method . The gender of a student does not have anything to do with his/her academic performance. Male students are not academically superior to their female students' counterparts.

Key words: Academic performance, Engineering drawing, Female students, Male students.

## Introduction

The development of technical knowledge from the dawn of history and to a large extent made possible by graphical language[ 1]. Today the ultimate connection between engineering and its universal graphical language is more vital than ever before, and the engineer who is ignorant of or deficient in his technical field is professionally illiterate . the descriptive geometry and technical drawing are required subjects in virtually every engineering school in the world. Engineering drawing is a compulsory course for all students offering one kind of engineering course in order to become a successful engineer need adequate and in-depth knowledge of engineering drawing.

[ 2]) defined engineering drawing as the non-oral language being employed to give precise technical information, which fully describe the shape, size, dimension, degree of finish, tolerances, assembly arrangement and other details about a component or assemblage. This could be in form of a structure (e.g. a bridge or a building); a machine element (e.g. a block making machine, a vice clamp or an aircraft engine); an electrical component (e.g circuits for electronics); pipe networks and so on.

The role of engineering drawing in technological development cannot be overemphasized, as it is a means of communication through which relevant information are given. The importance of engineering drawing is also a challenge to every student studying the subject for it is mainly on technology that the prosperity of Nigeria depends. Good technology will also boost our agriculture, and this will guarantee the production of food for the growing population, the generation of employment and the foreign exchange earnings [ 3].

Engineering drawing is faced with many difficulties in Nigerian higher institutions, even though the subject is given a place of prominence in the engineering curriculum. One of the difficulties being faced by engineering students is inability to comprehend the subject as majority of them lack “inner eyes” [ 4]. Another major problem is lack of teaching aids on topics like sectioning, assembly drawings, development and pattern among others [ 5].

Poor knowledge in allied subjects such as technical drawing, mathematics and space geometry at secondary level also contributes in no small measure to poor performance of students in engineering drawing [ 4]. [ 6] indicated that teachers believed that males are academically superior to females in a work on factors affecting female participation in education in some developing countries of Africa. However, the work carried out by [ 7] countered this view in his study, where a comparative study of male and female students, were conducted in agricultural science and biology in Kwara State College of Education, Ilorin. The result of his study showed that, there was no significant in the overall performance between the male and female students in the 2002 set.

Earlier work on students performance show that what female can do , male can do so in academics[ 7]. The major contents of what the courses entail are

Equipment and material used in drawing are drawing instruments, T-square, 45<sup>0</sup>

Triangle,  $30^{\circ}$  x  $60^{\circ}$  Triangle, scales, drawing pencils(H, 2H, HB), protractor, pencil eraser, dusting brush, drawing paper, tape or thumb tacks, drawing board ,etc.

There are geometrical construction like dividing a straight line into equal parts, constructing a square, a regular polygon, hexagon, orthographic projection in first and third angle projection, dimensioning, sectional views, isometric projection, auxiliary views, oblique, circles and arcs, solids, ellipse, parabola, hyperbola, helix, involute, epicycloids or hypocycloid, technical sketching, angles, triangles, etc

#### Teachers Activities

The teacher is expected to present the students with the following drawing instruments: Drawing set, T-square, drawing board, set squares and types of pencils and to demonstrate the use of them all to the students.

#### Students Activities

Students to illustrate the construction of simple geometric figures and shapes and teacher to assess it. Students to then construct parallel and perpendicular lines and teacher to assess it. The students to construct and bisect lines, angles and areas and teacher to assess it. To divide a straight lines into a graph number of equal parts using the compass and teacher to assess it. To differential between regular and irregular polygons and teacher to assess it[ 8].

### Previous Results Analysis

The results of performance of both female and male students in the two courses examined over the period of five years were presented in Table 1.

**Table 1: Computed mean scores of students for 5 years**

Academic Year	Students' Performance in	
	MEE 201	
	Female	Male
	Mean score of 10 students	Mean score of 20 students
2005/2006	2.50	2.3125
2006/2007	2.875	3.4375
2007/2008	2.75	2.8750
2008/2009	2.50	3.0625
2009/2010	3.00	3.3125
MEE 202		
2005/2006	3.25	2.3750
2006/2007	2.50	2.8125
2007/2008	2.25	2.8125
2008/2009	2.00	3.3125
2009/2010	3.00	3.3125

From Table 1, the means for yearly performance for both female and male students for five years were computed; the results were presented in Table 2.

**Table 2: Means of Yearly Performance of both Female and Male Students**

Year	MEE 201	MEE 202
2005/2006	2.40625	2.8125
2006/2007	3.15625	2.65625
2007/2008	2.8125	2.53125
2008/2009	2.78125	

The mean scores were further subjected to t-tests and the results were presented in Tables 3.

Table 3: Results of Chi-square tests in MEE 201 and MEE 202

Course	At one tail		Remark	At two tails		Remarks
	t cal	t-crit		t cal	t-crit	
MEE 201	0.130	1.94	No significant	0.26	2.44	No significant difference
MEE 202	0.151	1.89	No significant	0.30	2.36	No significant. Difference

Table 1,2 & 3 shown is [ 9]

It can be seen that from the results of t-tests in both courses examined, there is no significant difference between the performance of female and male students, in the two engineering courses i.e. in MEE 201 and MEE 202 as t calculated at both one tail and two tails are less than t-critical for both courses at 5 %. The results of this study seem to agree with the reports of [10] and [ 11] that gender analysis of performance is not on biological differences. This study also agreed with the work of [ 7], where the researcher concluded that, there was no significant difference in the overall performance between the male and female students in the agricultural science and biology in Kwara State College of Education, Oro in the 2002 set.

The work of [ 12] also gave similar results. However, the results of this study contradicted the views of some teachers, who believed that males are academically superior to females in some developing countries of Africa as expressed by [ 6].

Table 4 the difference in computed final result of Agricultural fieldwork(2002 set)

Period	Sex group	No of students	Mean score	Std. deviation
2002	Female	20	2.698	0.561
	Male	30	2.732	0.627

Table 5 the difference in computed final result of Biology(2002 set)

Period	Sex group	No of students	Mean score	Std. deviation
2002	Female	20	2.698	0.561
	Male	30	2.732	0.627

Table 6 The t-test analyses of male and female performance is agriculture and biology used in the relationship.

Period	Sex group	No of students	Mean score	Std. deviation
2002	Female	20	2.698	0.561
	Male	30	2.732	0.627

Tables 4,5 & 6 : [ 7]

The statistical analysis of the students overall performances of the 2002 set revealed that there was no significant difference in the academic performances of the male and



female students in Agriculture and Biology. The statistical outcome of the study showed that Agriculture and Biology involves physical activities such as land clearing, ridging , planting, fertilizer application, harvesting, and processing, laboratory practical works, e.t.c. does not prevent the females from performing equally well with their male counterparts. This situation seems to agree with the report of [ 10], and [ 11] that gender analysis of performance is not on biological differences. This is one of the aims of the millennium development goals, a challenge for today's intellectuals that every hand must be on deck to develop this nation especially in the area of Agriculture.

### Conclusions

The above shows that what the male and the female students need is hard work and confidence that they can do any thing when they are thoroughly taught in which the students and the teachers have a role to play as work it in the studio and assessing it method . The gender of a student does not have anything to do with his/her academic performance. Male students are not academically superior to their female students' counterparts.

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