MASTERS OF SCIENCE IN TECHNICAL EDUCATION

(MECHANICAL ENGINEERING)

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A COMPARATIVE STUDY ON ENGINEERING STUDENT'S PERFORMANCE BETWEEN SINGLE-GENDER CLASS ROOM AND COED CLASSROOM IN ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)

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DECLARATION

This is to certify that the work presented in this thesis is the outcome of the research carried out by **Faruq Bashir Iron-Baba** under the supervision of **Prof. Dr. Faruque Ahmed Haolader**, in the Department of Technical and Vocational Education (TVE), Islamic University of Technology (IUT), Gazipur, Bangladesh. It is hereby declared that this thesis/report or any part of it has not been submitted elsewhere for the award of any Degree or Diploma.

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DEDICATION

I am dedicating this thesis to those beloved people who have meant and continue to mean so much to me.

First and foremost, to my dear parents **Alh. Bashir Iron-Baba** and **Hajiya Fatima A.D Saude**, whose love for me knew no bounds and, who taught me the value of hard work. Thank you so much for all you have given to me in this world. I will never forget you.

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ABSTRACT

The purpose of this research was to conduct a comparative study to find out which setting performs better between students in Coeducational Instruction setting and Students in Single-gender Instruction setting. In this research process, the researcher compared the performance of students who receive instruction in single-gender classroom with the performance of other students who receive instruction in a coeducational classroom. The population of the study was 756 students of both single and mixed-gender streams which are classified into two groups (A & B). Out of this, one single-gender male class of 268 students (group A) and one coed class of 488 students (group B) were sampled from Islamic University of Technology (IUT). The researcher adopted quasi-experimental research design. The instruments used for data collection was the summative assessment of first and second semester result of both groups that serve as a test instruments. Frequency counts and the Arithmetic means were used for descriptive analysis. The independent sample t-test statistical technique was used to test the hypotheses. This study is anchored on (Bandura, 2001) social learning theory since it emphasizes the importance of biological, social and cultural impacts on human behavioral development and learning especially on gender and genders specific traits and roles. So also an online survey questionnaire was distributed to determine how well the experimentally obtained results expected theoretically on the hypothesis. The Chi-square statistical technique was used to test the hypotheses as a test of 'goodness of fit' (Rao, 2002).

Based on the analyses and interpretation of the data, the researcher found that Students who receive instruction in co-ed class are more motivated to prepare well in making good presentation in the class than students who receive instruction in single-gender class. On the other hand, it was found that Students who receive instruction in single-gender class enjoy working in a group project or assignment more often than those students who receive instruction in co-ed class. The study also found that male students perform better academically in single-gender classes in contrary to their academic performance when mixed with female in same classes. Thus, single-gender instruction could be a more favorable environment for male students than coeducational instruction environment.

LIST OF ACRONYMS

CEI	Coeducational Instruction
GPA	Grade Point Average
GEA	Gender and Education Association
IUT	Islamic University of Technology
ISCED	International Standard Certificate of Education
NH	Null Hypothesis
OIC	Organization of Islamic Cooperation
P-value	Probability Value
SGE	Single-Gender Education
SGI	Single-Gender Instruction
SPSS	Statistical Package for Social Science
S-value	Square Value
TVE	Technical and Vocational Education
W.A	Weighted Average

CHAPTER ONE

1.0 Introduction

The introduction chapter describes the background information of the study. It includes the key words, background of the research, the research questions and limitations of the study.

1.1 Background

Classroom coordination has a great influence on student's achievement; several numbers of debates from different angles around the world have been made about the impact of classroom arrangement on the performance of students. Some scholars are proponents on same-gender classroom performs better in instructional settings, while others contradict it with their own point that coed classroom performs better in instructional settings (Keri, 2002);(Pellegrini & Bohn, 2005); (Rex & Chadwell, 2009).

Most of the researches conducted on this comparison are based on collages and high schools, only few researches are in context to university level education. This research was conducted to find out the above comparison in IUT (University settings).

Since the establishment of IUT from the year 1981, the university runs in SGI education setting which used to admit only male students in every academic year for more than three decades. Later on issues start rising, advising the general assembly of Organization of Islamic Cooperation (Armbrust et al.) to provide necessary facilities in the University to make it a co-educational institution in order to remove the gender segregation in education and also to help in development of human resources on both gender (male and female) in the member countries of OIC (in the fields of engineering and technology as well as technical education and management). The general assembly of OIC discusses the issue afterwards and came out with a resolution to make the institution a co-educational institution. From academic session 2016/2017, the University has begun to admit female students as well as male students at undergraduate level which has brought topic of discussion within individuals. Some people are proponents of SGI classroom are be better for the University, while their opponents disagreed with that by stating their own views that CEI classroom will perform better for the University (Keri, 2002);(Pellegrini & Bohn, 2005); (Rex & Chadwell, 2009).

Thus, the purpose of the study is to solve the above debate among individuals and to strengthen the present knowledge base regarding the effect of SGI and CEI on students' performance.

On this hypothesis, various researches from different angles around the world have been made to find out the most effective classroom arrangement between SGI and CEI setting. The benefits and risks of single-gender instruction (SGI) and single-gender education (SGE) as opposed to coeducational instruction (CEI) have long been debated. In SGI settings, students are taught in single-gender classrooms within an overall coeducational education (CE) setting, while in SGE settings, the school is comprised wholly of one gender (Hoffman, Badgett, & Parker, 2008). Some researchers, like G. Stanley Hall, state the notion that both boys and girls do their best work in gender-segregated environments (Graebner, 2006), while other studies have found that girls excel more in single-sex schools, but boys do best in co-educational schools (Wong, Lam, & Ho, 2002). Little research, however, has been done on how the effects of classrooms with different gender compositions may carry over into freshman year of college, specifically in a co-ed college setting.

1.2 Research objectives

This study was carried out with the following objectives:

1. To find out if there is any significant difference in academic performance of IUT students, between single-gender and coed classes.

2. To identify the difference in students' level of interaction between coed and single-gender classrooms.

1.3 The Null Hypothesis

The study was carried out with the null hypothesis as given below:

i.   Null hypothesis 1 (NH1) states that:

There is no significant difference between the academic performance of IUT students, between single-gender and coed classes.

ii.   Null hypothesis 2 (NH2) states that:

There is no significant difference between the academic performance of IUT students, between Male and Female students receiving instruction in co-ed class.

iii. Null hypothesis 3 (NH3) states that:

There is no significant difference in level of interaction of IUT students, between single-gender and coed classes.

1.4 Limitations

Limitations of this study are as follows:

1. Because the study focuses on only one University, the data gathered and any conclusion generated will be applicable only to this particular institution, or to institutions that are very similar.

2. Because the study focuses on only two years of data, (one year of CEI classes and one year of SGI classes), the result generated will be limited in scope to these two years.

3. Academic achievement has been found to be influenced by many factors including, but not limited to: individual students' activity, the quality of instruction offered; the rigor of the curriculum presented; time on task; and school as well as classroom arrangement. This study did not consider any of these factors.

4. Another limitation to the study is that in IUT the SGI classroom exists among male students only.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The jury is still out on the issue of classroom gender composition. Since 1830, during the American Revolution era, when coeducation was first proposed, there has been a strong debate over whether boys and girls should learn in the same classroom (Graebner, 2006). The current, most widely-accepted school of thought is that single-gender instruction SGI is best for girls, while co-ed CEI is better for boys, even to the extent of influencing parents in their decision on what type of school to enroll their children in (Jackson & Bisset, 2005). Even though, research can be found to support a wide spectrum of theories. Plenty of study aimed only at girls demonstrates that SGI is the better option; however a few researches found the opposite. Many researchers discovered that SGI yields poor performance on boys, while another researcher dig out that it was actually a positive experience. Quite a few studies found that SGI was best for both boys and girls, while a few found that there was no difference at all in performance between students in CEI settings and students in SGI settings, but this thesis work conduct a comparative study to find out which setting performs better between students in CEI settings and Students in SGI setting. An excerpt literature will appear in the following section from (O'Malley, 2011). These research findings will be outlined.

2.1 SGI: Good for girls

Different research studies as early as 1998 and as recent as 2010 show that girls at numerous ages and grade levels benefit from being segregated by gender in school, and this is obvious that the majority of data available on the topic is concurrent with this ideal. The data from these studies indicate a multitude of potential benefits to be reaped from SGI, in areas ranging from academic performance to self-concept and gender-typed behavior patterns. Keeler (1998) in his research he dig out that female of eleventh and twelfth graders in CEI classrooms reported significantly higher mean scores on the Femininity Scale than girls from SGI environments. Thus this shows a positive sign on SGI settings, as the dominant hypothesis is that "androgynous individuals are more „behaviorally flexible" than others, (Spence & Helmreich, 1980)," meaning that a lower score on the Femininity Scale is advantageous for girls. Additionally, (Crombie, Abarbanel, & Trinneer, 2002) found that eleventh grade girls from SGI Computer Science

classrooms "reported higher levels of perceived teacher support, confidence, and future academic and occupational intentions than did females from mixed-gender classes." Another research on Computer Science classes found that girls in SGI settings were significantly happier with their classroom experience than girls in CEI settings (Logan, 2007). So also (Treanor, Graber, Housner, & Wiegand, 1999) found SGI to be equally well-perceived in the physical education setting, reporting that girls "perceived that they performed skills and played team sports better, received more practice opportunities, and were less fearful of injury in SGI settings (1998)." Similar results relating to physical education were obtained in a Turkish study by Koca, Asci, and Demirham (2005), indicating that female students prefer to be in all-girls gym classes. A particularly interesting British study by (Younger & Warrington, 2002) found that the majority of female students, as well as their teachers and parents, perceive SGI settings to be advantageous in a number of ways. SGI classrooms are perceived to be pleasant and safe, hassle-free, confidence-building, promoting private and personal exploration, and overall beneficial and conducive to teaching-learning (Younger & Warrington, 2002). In 2003, (Shapka & Keating, 2003) studied a group of ninth and tenth grade girls who received SGI in the context of a coeducational public school, and found that the students performed significantly better in both math and science, and course enrollment was significantly higher. In a 2009 study, (Shapka, 2009) also found SGI to be a "protective mechanism" against the typical „U-shaped" math score trajectory throughout high school, as girls receiving SGI did not experience the same drop in grades from tenth to twelfth grade that girls in CEI settings commonly exhibit. English performance also improves significantly with SGI according to (Mulholland*, Hansen, & Kaminski, 2004). In a recent 2010 study, (Sullivan, Joshi, & Leonard, 2010) found that SGI is positive for 16-year old girls in a multitude of academic outcomes.

2.2 SGI: Bad for Girls
Although much more difficult to procure, a small numbers of researches does exist arguing that SGI is detrimental to female students. (Limbert, 2001) administered the Eating Disorder Inventory (Zulueta & Costales Jr) to a group of 647 female college students, on which a higher score indicates a higher likelihood of an eating disorder. She found that "students who had previously attended single-gender schools and boarding schools obtained higher scores than their contemporaries from co-educational or day schools on some of the EDI subscales." Additionally,

in direct contradiction to the aforementioned (Spence & Helmreich, 1980) study, (Meinster & Rose, 2001) found that girls in SGI environments were more gender typed than those in CEI settings, showing stronger interest in traditionally female dominated careers.

2.3 SGI: Bad for boys

The dominating school of thought is that CEI settings are better for boys. Studies show that boys may even prefer CEI classrooms as well. (Lirgg, 1994) found this to be the case for middle school as well as high school boys, who perceived SGI very unfavorably. A study of eighth grade students in Thailand by (Jimenez & Lockheed, 1989) found that coeducational schools help boys to improve performance in math. Similar results were found in secondary school students in Hong Kong (Wong et al., 2002), pertaining to not only math but to a multi-subject standardized test. Both of these results are concurrent with British research by (Jackson & Bisset, 2005). In addition to the academic deficit found for boys in SGI settings, research also suggests that there are social deficits as well. Jackson (2002) found that SGI schools may exacerbate the "problematic macho male cultures inherent in schools," and certainly do little to challenge them, which can lead boys to become more gender-typed and therefore more rigid in their gender role ideas.

2.4 SGI: Good for boys

Though less frequently reported, some studies do suggest that boys can benefit from SGI environments. In a 2003 study on male high school graduates, James and Richards found that boys who graduated from SGI settings exhibit higher interest in the humanities in college and career settings. Similarly, (Karpiak, Buchanan, Hosey, & Smith, 2007) found that men from SGI secondary education backgrounds were significantly more likely to "declare and graduate in gender-neutral majors than those form coeducational schools."

Studies like that of (Treanor et al., 1999) also show that boys may prefer to be in SGI settings, in this case pertaining to physical education. In this particular study, middle school boys "perceived that they performed skills and played team sports better, received more practice opportunities, competed harder, learned more, behaved better, and were less fearful of injury in SGI physical education." Similar results relating to physical education were obtained in a Turkish study by Koca, Asci, and Demirham (2005), indicating that male students prefer to be segregated by gender in gym class. Male students in a British study, as well as their teachers and parents,

perceive SGI as being a constructive and beneficial learning environment (Younger & Warrington, 2002). Also, results from an Australian study indicate that SGI settings improve English performance for boys (Mulholland* et al., 2004).

2.5 SGI: No difference

While much of the available research findings on the most beneficial classroom gender composition lean to one side or the other, a fair amount of studies show no difference at all between CEI settings and SGI settings in a number of areas. For instance, one study found that the frequency of incidents of sexism was not significantly different across school types (Lee, Marks, & Byrd, 1994), and another found that academic self-concept is not affected by classroom gender composition (Jackson & Smith, 2000). A French-Canadian study of middle and high school girls found no significant environmental effect in the areas of perceived parental and teacher support, competence beliefs, utility value, or achievement goals (Chouinard, Vezeau, & Bouffard, 2008). Evidence from a study by (Fleming & Zucker, 2002) showed that "type of high school alone did not influence any life goal." Interestingly this finding directly contradicts the previously mentioned studies" findings that SGI increases the likelihood that boys declare gender neutral majors (Karpiak et al., 2007), and that SGI is related to boys" higher interest in the humanities in college and career settings (Norfleet James & Richards, 2003).

2.6 Highlight: Recent Study

In a 2008 study in The Center for Evaluation and Assessment at the University of Nevada, Las Vegas, (Hoffman et al., 2008) evaluated the effectiveness of SGI on "achievement outcomes, instructional practices, teacher efficacy, student behaviors, and classroom culture in an urban, at-risk high school primarily composed of individuals from disadvantaged populations." The students of both genders were provided SGI in algebra and English class and were compared to students in CEI settings through comparison of standardized test scores, course grades, surveys, classroom observation, teacher interviews, and focus group discussion. The results were fascinating, some areas confirming previously stated findings, and others refuting them.

In this study, there were mixed results in the area of academic achievement. While one aforementioned study indicated that both male and female students showed a significant improvement in English performance in SGI settings (Mulholland* et al., 2004), this study

reported no difference between English achievement between SGI and CEI groups (Hoffman et al., 2008). The researchers did find an improvement in mathematics performance in the first year of SGI, which corroborates findings from studies by (Shapka & Keating, 2003) as well as (Shapka, 2009); however they found no significant improvement in the second year of SGI. Overall, CEI students performed better on standardized tests than SGI students (Hoffman et al., 2008). Additionally, (Hoffman et al., 2008) found that SGI "provided a supportive environment for girls, inducing a greater participation and academic risk-taking," which is a relatively common finding among researchers. In the area of student and teacher perception about SGI, the results were equally inconsistent. Results indicated that teachers perceived SGI to be conducive to learning, which upholds results obtained by British researchers (Younger & Warrington, 2002). However, in direct contrast to this same study, (Hoffman et al., 2008) found that both male and female students "criticize both the social and academic benefits of SGI." In terms of academic performance of students the Gender and Education Association (GEA) (2012) examine that certain subjects are gender stereotyped, for example, males believed to be better in mathematics, sciences and engineering and are therefore, masculine subjects and females believed to be better than males in language arts etc. findings (O'Malley, 2011) dig out that female students learn best in SGI environments while male students performs better in CEI environment. However, in contrast to the study, (Gwarjiko, 2015) found that the SGI settings could be a more favorable academic environment for male students than the CEI environment.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

The chapter is going to describe the population, sample selected from the population, the research design, the data collection procedures, and the statistical methods used for data analysis.

3.1 Population

The target population for this study is the students from IUT. The institution is a subsidiary organ of Organization of Islamic Cooperation OIC which is situated in Dhaka, Bangladesh. The institution is representing fifty seven Islamic member countries from Asia, Africa, Europe, and South America to develop human resources in the member countries of the OIC in the fields of engineering and technology as well as technical education and management. IUT basically is higher educational and research institution offering a wide range of undergraduate and postgraduate academic programs ranging from ISCED level 5 to 8 conducted in the fields of engineering, computer science and information technology and TVET teacher education training. However, this study focus on undergraduate level Bachelor's degree and Higher Diploma programs only.

3.2 Sample

The research includes students from SGI class of 2015-2016 and students from CEI class of 2016-2017. It was conducted to study the academic performance between the two groups by use of their summative assessment of first and second semester and also the students' level of interaction. The Groups sample includes all students who are on both lists as portrayed in Table 3.1, a total of 756 students. Group A (students of 2015-2016 academic session who receive instruction in a SGI classroom) consisted of 268 male students. Group B (students of 2016-2017 academic session who receive instruction in a CEI classroom) comprises of 488 male & female students.

In this study, the sample was selected from the population which comprises of the students from group A and B, and also use the appropriate tools for data collection.

Table 3.1 2015/2016 & 2016/2017 Session Enrollment (SGI & CEI classes)

Class	Male	Female	Total
SGI Class [Group A]	*268*	*-*	*268*
CEI Class [Group B]	*398*	*90*	*488*
			GT: 756

3.3 Research Instrument

The instruments used in conducting this research is the Data base of students' academic performance of first and second semester for both groups' and online survey questionnaire to find out the solutions to the research objectives stated in chapter one, section 1.3.

Firstly, the researcher make use of the students' academic performance 'Data base' for collecting GPA of first and second semester results of group A and B to find out if there is any significant difference in the academic performance of IUT students, based on summative assessment between SGI classroom and CEI classroom.

Secondly, for finding answer to the second research objective stated in section 1.3, an online survey questionnaire adopted from (Eagan et al., 2014) was distributed to identify the difference in students' level of interaction between SGI classroom and CEI classroom. Thus, the online survey questionnaire was distributed to the sample selected size of 132 students (47 respondents from SGI class and 85 respondents from CEI class) to identify the difference in students' level of interaction between SGI classroom and CEI classroom.

3.4 Data Collection

The data was collected and compared between the academic performance of students' who are enrolled in 2015-2016 academic session (SGI) and those students enrolled in 2016-2017 academic session (CEI) in IUT by use of their summative assessment of first and second semesters. Also an online survey questionnaire was used to gather information from the selected sample to find out the difference in students level of interaction between the two groups.

3.5 Data Analysis

Data was statistically analyzed and tallied. Data was gathered base on the variables dictated by each of the research objectives stated in Chapter 1. Frequencies and percentages were recorded for all items on the student's assessment DATA BASE. The statistical test was evaluated at an alpha level of $p < .05$ (Gall et al., 2007). An independent samples t-test was used to determine whether the difference between the means of student scores in SGI classroom and CEI classroom will be statistically significant, and also a chi-square test was used to find out the difference in students' level of interaction between the two groups, as analyzed by the SPSS computer program.

CHAPTER FOUR

ANALYSIS OF DATA

4.0 Introduction

In this chapter, the statistical methods presented were used to proof the null-hypothesis rejected or accepted and also the data from online survey questionnaire was analyze and interpreted.

4.1 Analysis methods to find out the difference

4.1.1 T-Test

The t-test (student, 1908) is a statistical data analysis procedure mostly used for testing if the difference between the mean values of two groups is statistically significant and is unlikely to have occurred by chance. The t-test assumes various conditions (normal distribution, variance homogeneity, symmetry) of the characteristic distribution of the dependent variable. Should one or more of the condition be violated, requires the use of alternative test (Diehl & Staufenbiel, 2001). Sacrificing the precision of the t-test, students' t-test can also be used in case of un-equal sample size, if the variance is not equal (Ahmed, 2010). There are several kinds of t-test, but here the "two-sample t-test" also known as the "student's t-test" or the "independent samples t-test" was used to compare the mean values of GPA of first and second semester result between SGI classroom and CEI classroom in IUT. Though, this test is often referred to as "independent sample t-test", as it typically applied when the statistical units underlying the two samples being compared are non-overlapping. The two-sample t-test was used in order to find out if there is any difference in students' performance between SGI classroom and CEI classroom in IUT.

The academic performance of students of both SGI and CEI is measured by their cumulative assessment (summative evaluation) and is recorded as semester-wise grade point average (GPA). The *null hypothesis,* which is assumed to be true until proven wrong, is that there is really no difference between the two groups. In this research study the two groups of students which are group A and B may have different mean values (GPA). However, there may be a real difference between these two mean values, or just a chance difference in these samples. The t-test statistic determines a p-value (probability value) that indicates how likely these results could have been gotten by chance. By convention, if the p-value is less than 0.05 ($p < 0.05$), it is concluded that the null hypothesis is rejected (i.e. It indicates that there is significant different between the two

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groups). In other words, when p > 0.05 we say that the null hypothesis fail to reject (i.e. there is no significant different between the two groups). (Haolader, 2010);(Bortz & Weber, 2005); (Diehl & Staufenbiel, 2001).

4.1.2 Test for homogeneity of variances using Levene test
The applicability, i.e. the robustness of the t-test is linked to the above mentioned conditions. The test for compliance of variance homogeneity of distributions is made by Levene test. This test is integrated in the t-test function in SPSS. If the test fails significantly, the robust welch-test is applied(Diehl & Staufenbiel, 2001).

4.1.3 Welch's t-test
In statistics, **Welch's t-test,** or **unequal variance t-test,** is a two-sample location test which is used to test the hypothesis that two populations have equal means. Welch's t-test is an adaptation of student's t-test and is more reliable when the two samples have equal variance and unequal sample size (De Winter, 2013). Given that Welch's t-test has been less popular than student's t-test and may be less familiar to readers, a more informative name is "Welch's unequal variance t-test" or "unequal variance t-test" for brevity. While student's t-test assumes that the two populations have normal distributions and with equal variances, Welch's t-test is designed for unequal variances, but the assumption of normality is maintained.

4.2 Research objective 1
The Data was collected from the two groups which are: group A (undergraduate students which are enrolled in 2015/2016 session and receive instruction in SGI classroom) and group B (undergraduate students which are enrolled in 2016/2017 session and receive instruction in CEI classroom) in IUT.

4.2.1 Students academic performance in first and second semester exams
  i. *Comparison of First semester students' academic performance between SGI and CEI*
The null hypothesis was tested to find out if there is any different in academic performance between the two groups.

In order to examine the hypothesis, GPAs obtains by the students of the two groups were examined. Figure 4.1 shows the histograms of the GPAs obtained by total 674 students of both group A and B who passed there exams out of 756 students. The mean values of GPAs in the first semester exams of group A and B were 3.3864 and 3.3353, respectively. The statistical values of students' performance in GPA are shown in Table 4.1.

Figure 4.1 Histogram of GPAs obtained by students of Group1 (SGI) and Group2 (CEI)

Table 4. 1 Statistics of students' first semester academic performance (in GPA) of both groups

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Score	Group A (Single-Gender Class)	237	3.3864	.40487	.02630
	Group B (Co-ed Class)	437	3.3353	.40440	.01935

In order to verify if the difference between the average values of the two groups determined above is statistically significant and is unlikely to have occurred by chance, the "two-sample t-test" was carried out. The findings of this "t-test" are given in Table 4.2.

Table 4. 2 Results of the independent Sample t-test for GPA of First Semester

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
					Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
	F	Sig.	t	df				Lower	Upper
Equal variances assumed	.104	.747	1.565	672	.118	.05109	.03264	-.01300	.11517
Equal variances not assumed			1.565	483.812	.118	.05109	.03265	-.01306	.11523

To determine which row of numbers to use, we must look at the sig (p-value) for the F value levene's test sig=0.747. Here, 0.747>0.05 and so the variance are assumed to be equal. So, the upper row for the t-test result was used.

Now, we evaluate the t-test result. Here, alpha=0.05, using the upper row, t=1.565, the degree of freedom, d f=672, the significance (two-tailed), p=0.118. in this case, the estimated **p** is higher than the normally accepted significance level of 0.05 (significance) (Haolader, 2010);(Bortz & Weber, 2005); (Diehl & Staufenbiel, 2001). This proves that the null hypothesis failed to reject. In other words, there is no significant difference between the academic performance of students in SGE classroom and students in CEI classroom.

After finding out if there is any significant different between academic performance of the two groups, also the students' academic performance was examined to find out the difference in students' academic failure between the groups; the failure rate in academic performance of the students in both groups with total number of 756 students (268 students in SGI and 488 students in CEI) was examined and dug out the findings that 25 students got referred out of 268 student with 9.33% rate in SGI classroom while in CEI classroom 45 students got referred out of 488 students with 9.22% rate. And also in SGI classroom 7 students failed out of 268 students with

2.23% rate while in CEI classroom 5 students failed out of 488 students with 1.23% rate. Table 4.3 shows the students' academic failure of first semester between the two groups.

Table *4.3 Students academic failure of First Semester*

Class	N	Referred		Failed	
		Total	**(%)**	**Total**	**(%)**
Group A (SGI)	*268*	*25*	*9.33*	*6*	*2.23*
Group B (CEI)	*488*	*45*	*9.22*	*6*	*1.23*

In respect to the argument we found out that there is no significant difference in academic failure of students between SGI classroom and CEI classroom whereby the rate of failure between the two groups is almost similar.

ii. *Second semester students' academic performance between SGI and CEI*

To determine if there was any difference between the students mean score of SGI classroom and CEI classroom, the exam result (second semester GPA) of SGI and CEI students were collected and analyzed using independent sample t-test in SPSS.

Also in order to examine the hypothesis, GPAs obtains by the students of the two groups were examined. Figure 4.2 shows the histograms of the GPAs obtained by total 616 students of both group A and B who passed there exams out of 728 students. The mean values of GPAs in the second semester exams of group A and B were 3.3711 and 3.2160, respectively.
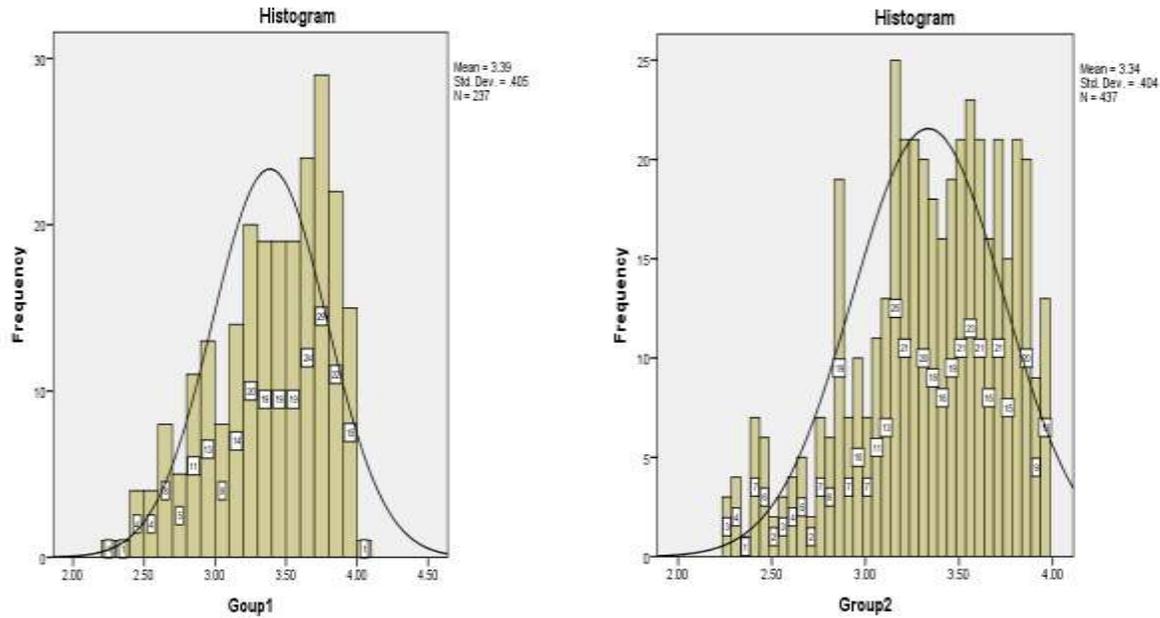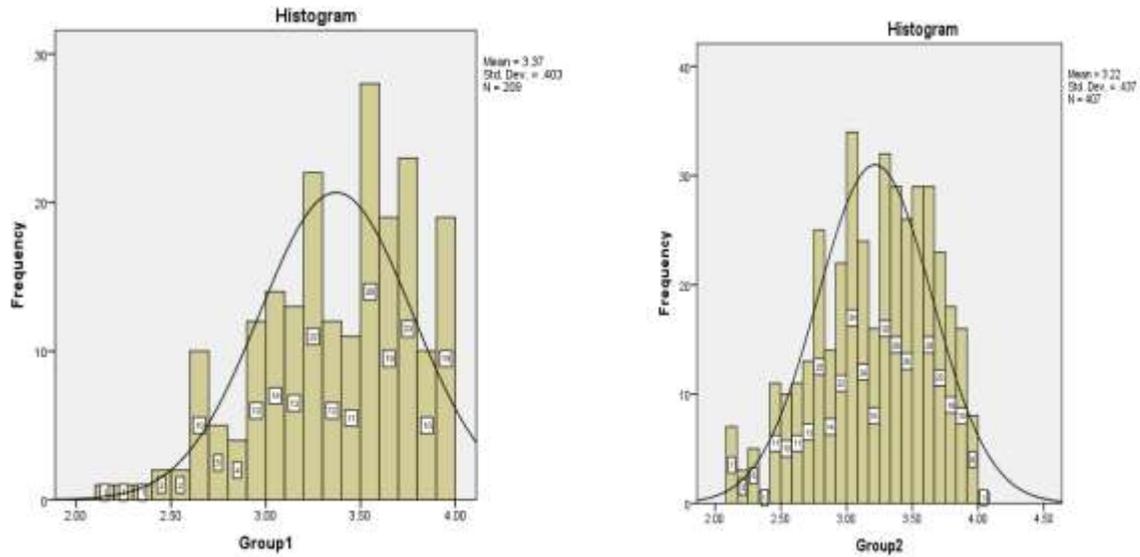
Figure 4.2 Histogram of GPAs obtained by students of Group1 (SGI) and Group2 (CEI)

Table 4.4 Statistics of students' second semester academic performance (in GPA) of both groups.

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Score	Group A (Single-Gender Class)	209	3.3711	.40323	.02789
	Group B (Co-ed Class)	407	3.2160	.43654	.02164

In order to verify if the difference between the mean values of the two groups determined above is statistically significant and is unlikely to have occurred by chance, the "two-sample t-test" was carried out. The findings of this "t-test" are given in Table 4.5.

Table 4.5 Results of the independent Sample t-test for GPA of Second Semester

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
						Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		F	Sig.	t	df				Lower	Upper
Score	Equal variances assumed	1.953	.163	4.284	614	.000	.15513	.03621	.08401	.22625
	Equal variances not assumed			4.394	450.180	.000	.15513	.03530	.08575	.22450

To determine which row of numbers to use, we must look at the sig (p-value) for the F value levene's test sig=0.163 Here, 0.163>0.05 and so the variance are assumed to be equal. So, the upper row for the t-test result was used

Now, we evaluate the t-test result. Here, alpha=0.05, using the upper row, t=4.284, the degree of freedom, d f=614, the significance (two-tailed), p=0.00. in this case, the estimated **p** is very much less than the normally accepted significance level of 0.05 (significance) (Haolader, 2010);(Bortz & Weber, 2005); (Diehl & Staufenbiel, 2001). This proves that the null hypothesis is rejected. In other words, there is significant difference between the academic performance of students in SGE classroom and students in CEI classroom. This result indicates that students in SGI perform significantly better than those students in CEI.

After finding out if there is any significant different between academic performance of the two groups, also the students' academic performance in-term of failure rate was examined between the groups; the failure rate in academic performance of the students in both groups with total number of 728 students (247 students in SGI and 481 students in CEI) was examined and dug out the findings that 32 students got referred in SGI classroom with 12.96% rate while in CEI classroom 70 students got referred with 14.55% rate. And also in SGI classroom 6 students failed with 2.43% rate while in CEI classroom 4 students failed with 0.83% rate. Table 4.6 shows the students' academic failure of second semester between the two groups.

Table 4.6 Students academic failure of Second Semester

Class	N	Referred		Failed	
		Total	**(%)**	**Total**	**(%)**
Group A (SGI)	*247*	*32*	*12.96*	*6*	*2.43*
Group B (CEI)	*481*	*70*	*14.55*	*4*	*0.83*

In respect to the argument we found out that there is significant difference in academic failure of students between SGI classroom and CEI classroom whereby the students in CEI classroom got more frequency of failure with high percentage rate than those students in SGI classroom in term of referred while in term of failed the students in SGI have more frequency of failure with high percentage rate than those students in CEI.

Figure 4.3 and 4.4 show the bar graph and profile chart of the disparity between the means in students' academic performance of first and second semester.
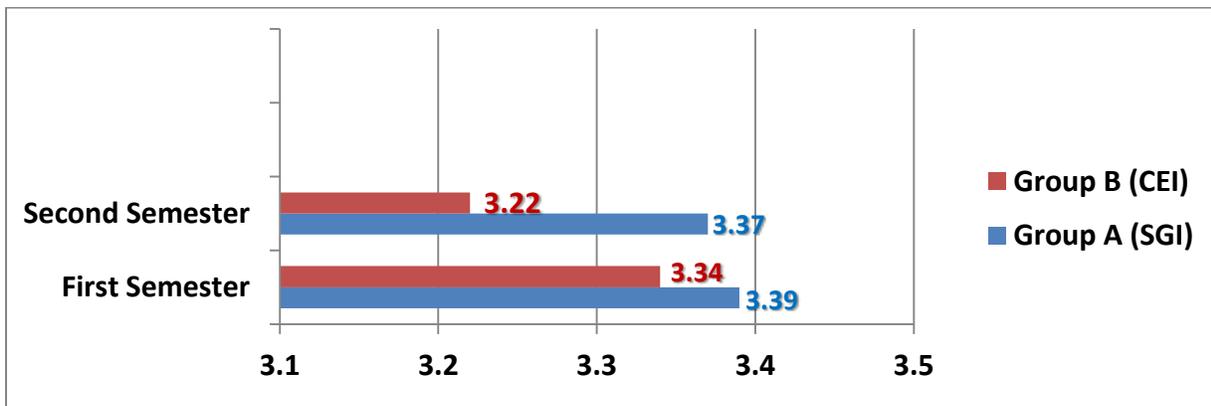
Figure 4.3 Bar graph of mean difference in students' academic performance of both groups
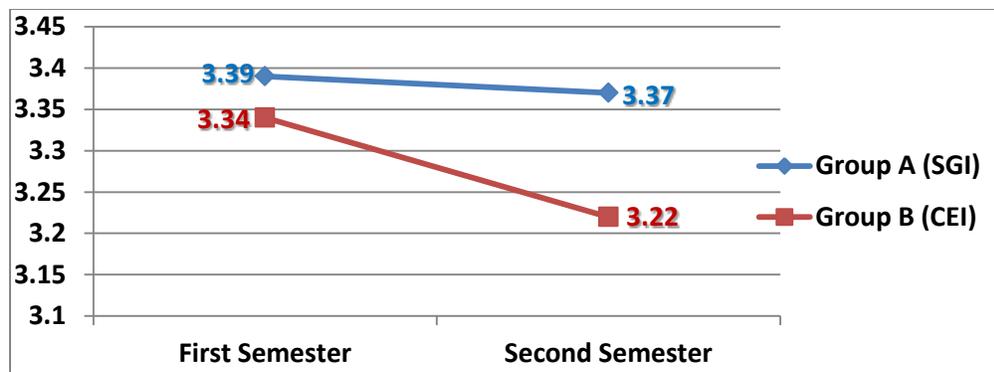
Figure 4.4 Profile chart of mean difference in students' academic performance of both groups

4.2.2 Comparison of Students' academic performance of first and second semester between Male and Female Students

After analysis between SGI and CEI with the findings of no difference between them in the first semester academic performance but in their second semester academic performance we found out that students in SGI perform better than those students in CEI. So, the research match forward to analyze the academic performance between male and female students who receive instruction in CEI classroom to find out if there is any significant difference between their academic performance of first and second semester.

i.   First semester students' academic performance between male and female students

To accept or reject the null hypothesis of no difference between the students mean score of male and female students, the exam result (first semester GPA) of male and female students were collected and analyzed using independent sample t-test in SPSS.

Here the male students are considered in Group M and female students are considered in Group F. In order to examine the hypothesis, GPAs obtains by the students of the two groups were examined. Figure 4.5 shows the histograms of the GPAs obtained by total 437 students of both group M and F who passed there exams out of 488 students. The mean values of GPAs in the first semester exams of group M and F were 3.3070 and 3.4524, respectively. The statistical values of students' performance in GPA are shown in Table 4.7.

Figure 4.5 Histogram of GPAs obtained by Group M (male) and Group F (female) students

Table 4.7 Statistics of students' first semester academic performance (in GPA) of both groups.

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Score	Male	352	3.3070	.41853	.02231
	Female	85	3.4524	.31570	.03424

In order to verify if the difference between the average values of the two groups determined above is statistically significant and is unlikely to have occurred by chance, the "two-sample t-test" was carried out. The findings of this "t-test" are given in Table 4.8.

Table 4.8 Result of the independent Sample t-test for GPA of First Semester

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Score	Equal variances assumed	8.662	.003	-3.001	435	.003	-.14534	.04843	-.24052	-.05015
	Equal variances not assumed			-3.556	163.391	.000	-.14534	.04087	-.22603	-.06464

To determine which row of numbers to use, we must look at the sig (p-value) for the F levene's test sig=0.003. Here, 0.003<0.05 and so the variance are not assumed to be equal. So, the lower row for the t-test result was used.

Now, we evaluate the t-test result. Here, alpha=0.05, using the upper row, t=-3.556, the degree of freedom, d f=163.391, the significance (two-tailed), p=0.000. in this case, the estimated **p** is very much less than the normally accepted significance level of 0.05 (significance)(Haolader, 2010) ;(Bortz & Weber, 2005); (Diehl & Staufenbiel, 2001). This proves that the null hypothesis is rejected. In other words, there is significant difference between the academic performance of male and female students in CEI classroom. This result indicates that female students perform significantly better than male students.

To find out if there is any significant difference between the two groups; the failure rate in academic performance of the students in both groups with total number of 488 students (398 male students and 90 female students) was examined and dug out the findings that 40 male students got referred with 10.1% rate while for the female students 5 of them got referred with 5.6% rate. And also 6 male students failed with 1.5% rate while none of the female students got failed with 0% rate. Table 4.9 shows the students' academic failure of first semester between the two groups.

Table 4.9 Students academic failure of first Semester

Gender	N	Referred		Failed	
		Total	**(%)**	**Total**	**(%)**
Male	*398*	*40*	*10.1*	*6*	*1.5*
Female	*90*	*5*	*5.6*	*0*	*0*

In respect to the argument we found out that there is significant difference in students' academic failure between male and female students receiving instruction in CEI classroom whereby the male students got more frequency of failure with high percentage rate than the female students.

i. *Second semester students' academic performance between male and female students*

To accept or reject the null hypothesis of no difference between the students mean score of male and female students, the exam result (second semester GPA) of male and female students were collected and analyzed using independent sample t-test in SPSS.

Here the male students are considered in Group M and female students are considered in Group F. In order to examine the hypothesis, GPAs obtains by the students of the two groups were examined. Figure 4.6 shows the histograms of the GPAs obtained by total 407 students M and F who passed there exams out of 481 students. The mean values of GPAs in the first semester exams of group M and F were 3.1728 and 3.3929, respectively. The statistical values of students' performance in GPA are shown in Table 4.7.
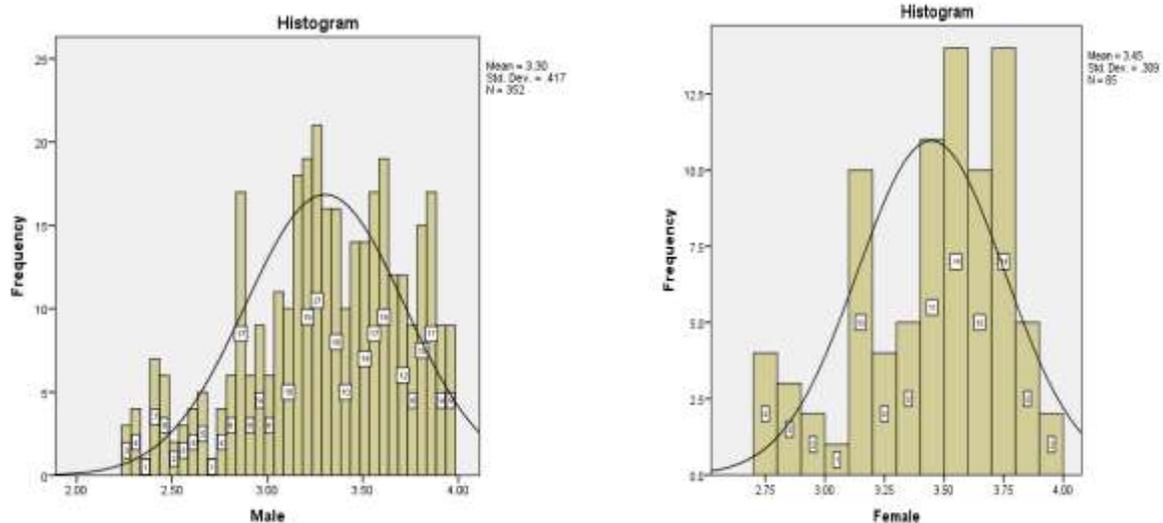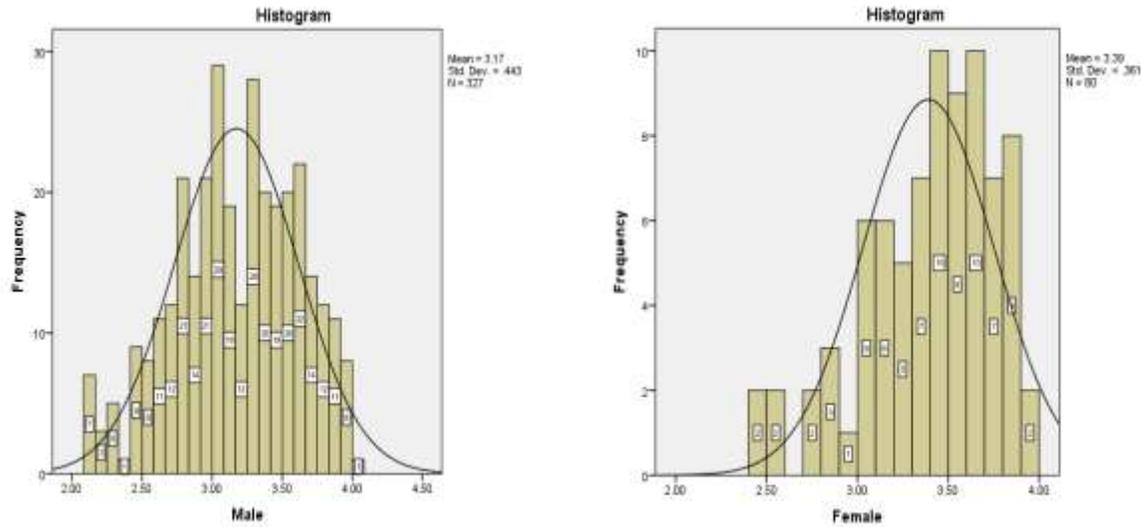
Figure 4.6 Histogram of GPAs obtained by Group M (male) and Group F (female) students

Table 4.10 Statistics of students' second semester academic performance (in GPA) of both groups.

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Score	Male	327	3.1728	.44270	.02448
	Female	80	3.3929	.36222	.04050

In order to verify if the difference between the average values of the two groups determined above is statistically significant and is unlikely to have occurred by chance, the "two-sample t-test" was carried out. The findings of this "t-test" are given in Table 4.8.

Table 4.11 Result of the independent Sample t-test for GPA of Second Semester

Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
									Lower	Upper
Score	Equal variances assumed	7.084	.008	-4.121	405	.000	-.22012	.05341	-.32512	-.11513
	Equal variances not assumed			-4.652	142.675	.000	-.22012	.04732	-.31367	-.12658

To determine which row of numbers to use, we must look at the sig (p-value) for the F value levene's test sig=0.008. Here, 0.008<0.05 and so the variance are assumed to be equal. So, the upper row for the t-test result was used.

Now, we evaluate the t-test result. Here, alpha=0.05, using the lower row, t=-4.652, the degree of freedom, d f=142.675, the significance (two-tailed), p=0.000. in this case, the estimated **p** is very much less than the normally accepted significance level of 0.05 (significance) (Haolader, 2010);(Bortz & Weber, 2005); (Diehl & Staufenbiel, 2001). This proves that the null hypothesis is rejected. In other words, there is very significant difference between the academic performance of male and female students. This result indicates that female students perform differ very significantly better than male students in CEI classroom.

To find out if there is any significant difference between the two groups; the failure rate in academic performance of the students in both groups with total number of 481 students (393 male students and 88 female students) was examined and dug out the findings that 62 male students got referred with 15.8% rate while for the female students 8 of them got referred with 9.1% rate. And also 4 male students failed with 1.02% rate while none of the female students failed with 0% rate. Table 4.12 shows the students' academic failure of second semester between the two groups.

Table 4.12 Students academic failure of second Semester

Gender	N	Referred		Failed	
		Total	**(%)**	**Total**	**(%)**
Male	*393*	*62*	*15.8*	*4*	*1.02*
Female	*88*	*8*	*9.1*	*0*	*0*

In respect to the argument we found out that there is significant difference in students' academic failure between male and female students receiving instruction in CEI classroom whereby the male students got more frequency of failure with high percentage rate than the female students.

Figure 4.7 and 4.8 show the bar graph and profile chart of the disparity between the means in students' academic performance of first and second semester.
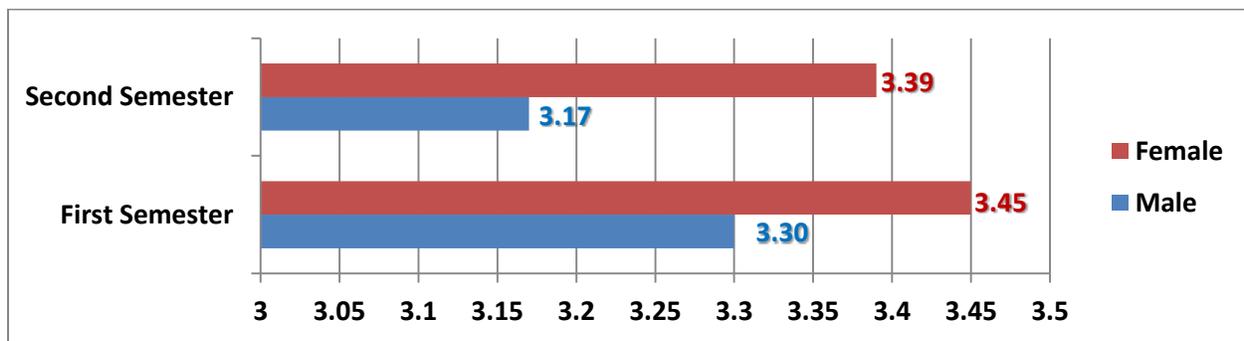
Figure 4.7 Bar graph of mean difference in students' academic performance of both groups
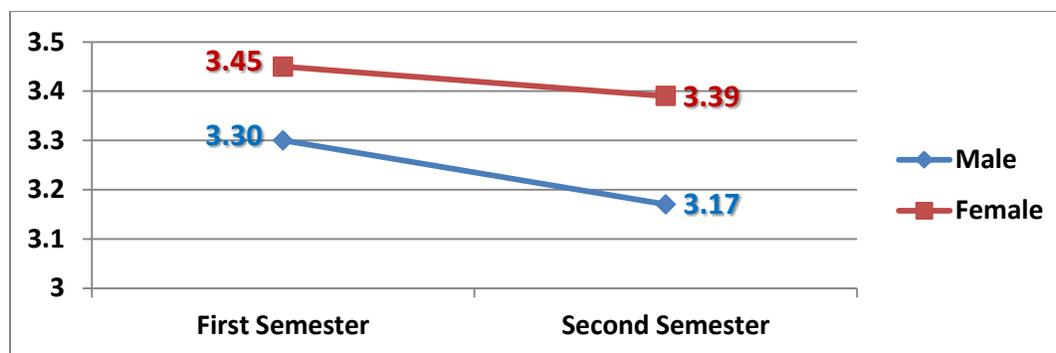
Figure 4.8 Profile chart of mean difference in students' academic performance of both groups

4.3 Analyses on Difference in Students' Level of Interaction

To find answer to the second research objective, the online survey questionnaire adopted from (Eagan et al., 2014) was distributed to both SGI (group A) and CEI (group B). 132 out of 756 students respond to the questionnaire which is 17.5% of the population (47 respondents from SGI out of 268 students which is 17.5% of the population and 85 respondents from CEI out of 488 students which is 17.5% of the population) as shown in Table 4.13.

Table 4.13 Online survey questionnaire response detail

Class	Number of Respondents	(%)	N
Group A	*47*	*17.5*	*268*
Group B	*85*	*17.5*	*488*
Total	*132*	*17.5*	*756*

The questionnaire was raised from three sections:

Section A: Students' Background Information

Section B: Students' Classroom Experience

Section C: Students' Social and Personal Development

4.3.1 Students' level of interaction in SGI
Section A: Students' Background Information

The 47 respondents were male students who receive instruction in SGI classroom. The majorities (66%) of them were between 19-22 years old. concerning the question asked to describe the higher secondary school they attended, 61.7% of participants attended public secondary schools, 38.3% attended private higher secondary schools.

When asked to describe their higher secondary/Collage school classes, majority (48.9%) of the students describe their higher secondary school/collage classes as single gender classes, 27.7% of the students describe their higher secondary school/collage Co-Ed classes and 23.4% of the students describe their higher secondary school/collage classes as mixed classes. When asked about the reasons for attending IUT, the majority of students reported choosing IUT because of its academic reputation, the students like the campus and their parents choose the university for them (See Fig. 4.9).

When asked to mark each of the activities they spent more than an hour doing every day in IUT, the most commonly reported answer was studying/homework, followed by Facebook/twitter, watching TV/movies and socializing with friends (see Fig. 4.10).
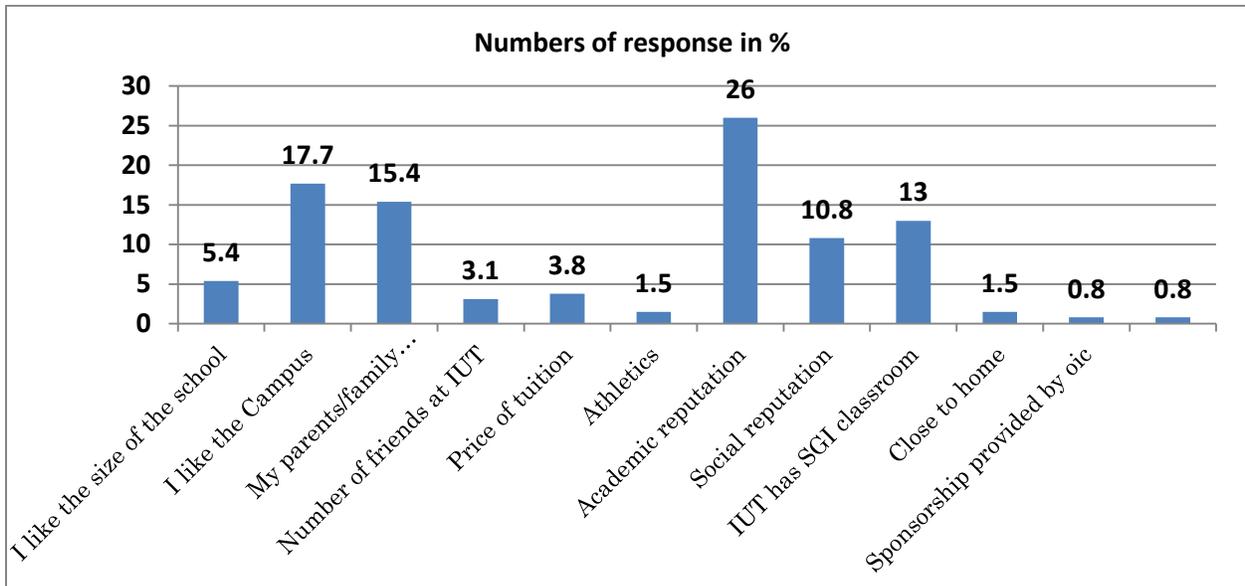
Figure 4.9 Factors influencing students to choose IUT

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Numbers of response in %
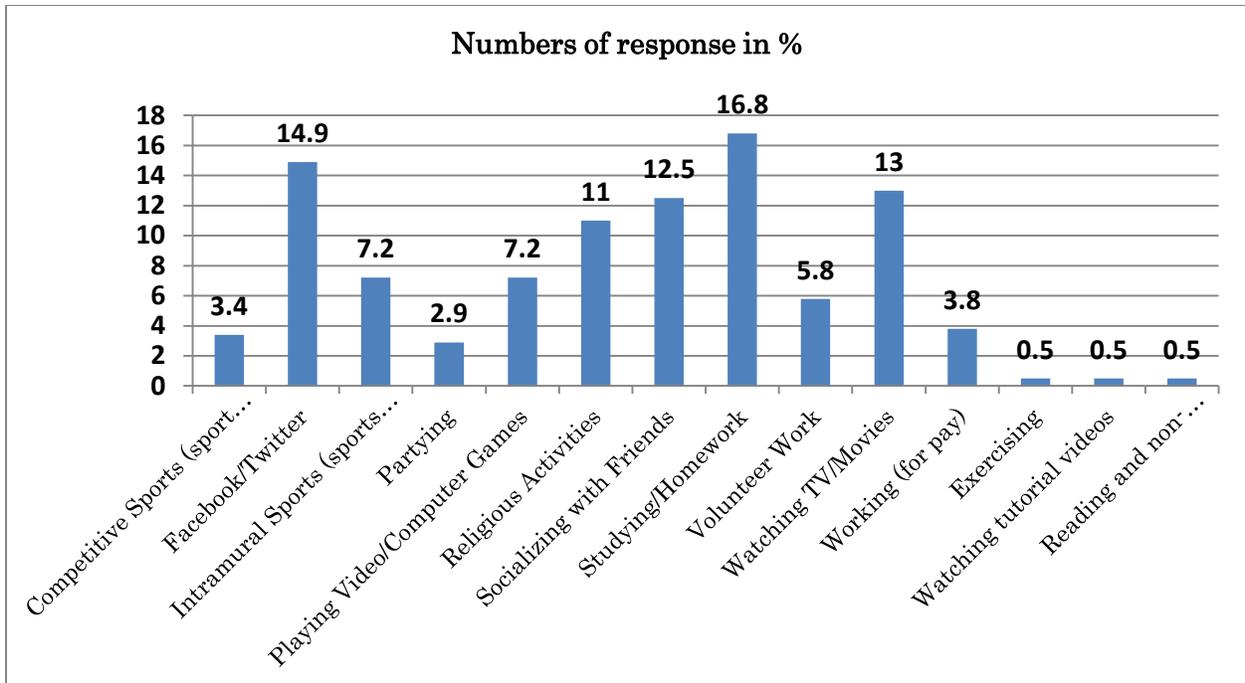
Figure 4.10 the activities students' spent more time doing per day in IUT

Section B: Students Classroom Experience

The table 4.14 below shows the analysis for students' classroom experience. The tittle columns represent the Item Statement, five point scale and its corresponding values, where strongly agree (SA)=5, Agree (A)=4, undecided (U)=3, disagree (D)=2, strongly disagree (SD)=1 respectively, and weighted average (W.A). The figures in the parenthesis indicate percentages and f represent the frequency while the (s-value) represent the significant value obtained from the Chi-square test.

Table 4.14Analyses of students' classroom experience

Item statement		5(SA)	4(A)	3(U)	2(D)	1(SD)	W.A	s-value
Being in a Single-gender class encourages me to be well prepared for quizzes and exams	f	*13*	*4*	*17*	*5*	*8*	*3.19*	*0.012*
	%	*(28)*	*(9)*	*(36)*	*(11)*	*(17)*		
Because there are no female students in the class I feel comfortable in asking question	f	*22*	*11*	*3*	*2*	*9*	*3.74*	*0.000*
	%	*(47)*	*(24)*	*(6)*	*(4)*	*(19)*		
The Single-gender class motivates me to prepare well in making good presentation in the class	f	*16*	*7*	*7*	*8*	*9*	*3.28*	*0.193*
	%	*(34)*	*(15)*	*(15)*	*(17)*	*(19)*		
In a Single-gender class I frequently participate in classroom conversation with the lecturer	f	*17*	*10*	*7*	*3*	*9*	*3.50*	*0.023*
	%	*(36)*	*(22)*	*(15)*	*(7)*	*(19)*		
Due to absence of Female students in the class I enjoy working in a group project or assignment	f	*22*	*6*	*9*	*4*	*6*	*3.72*	*0.000*
	%	*(47)*	*(13)*	*(19)*	*(8)*	*(13)*		
In a Single-gender class I'm more attentive and discipline during the instruction	f	*13*	*10*	*9*	*5*	*10*	*3.23*	*0.473*
	%	*(28)*	*(21)*	*(19)*	*(11)*	*(21)*		
Absence of Female students in the class boosts my effort to participate in extra-curricular activities (debate competition, robotic competition, symposium, project showcasing, business idea etc.) frequently	f	*9*	*9*	*6*	*9*	*14*	*2.79*	*0.473*
	%	*(19)*	*(19)*	*(13)*	*(19)*	*(30)*		
In a Single-gender class I feel free in using electronic medium (Facebook, Whatsapp, Twitter, YouTube, Google, Skype, Viber etc.) to discuss with other colleagues or to circulate information	f	*16*	*8*	*7*	*4*	*12*	*3.26*	*0.055*
	%	*(34)*	*(17)*	*(15)*	*(9)*	*(25)*		
In a Single-gender class I usually have serious conversations with students of a different race or ethnicity	f	*15*	*6*	*11*	*8*	*7*	*3.30*	*0.226*
	%	*(32)*	*(13)*	*(23)*	*(17)*	*(15)*		
A Single-gender class is the better environment for acquiring knowledge	f	*20*	*11*	*5*	*5*	*6*	*3.72*	*0.001*
	%	*(42)*	*(23)*	*(11)*	*(11)*	*(13)*		
In conclusion, Female students are the sunlight (Beauty) of the campus	f	*8*	*8*	*12*	*4*	*15*	*2.79*	*0.108*
	%	*(17)*	*(17)*	*(25)*	*(9)*	*(32)*		

In respect to Table 4.14 above, the researcher identified eleven (11) item statements in determining the students' classroom experience in the study area of which the results were analyzed and interpreted thus:

i.   *Being in a SGI class encourages me to be well prepared for quizzes and exams*

Regarding to the above statement, 28% of the students strongly agreed, 9% agreed, 36% undecided, 11% disagreed and 17% strongly disagreed with the statement. The weighted average 3.19 which is within the range of 2.5 and 3.5 that is; the opinions were uncertain, however the significant value 0.012 level is less than alpha value of 0.05 (p<0.05) means that the responses on this statement are not statistically significant which means the null hypothesis is rejected. And the opinions of the respondents on this statement were accepted which is statistically significant.

ii.   *Because there are no female students in the class I feel comfortable in asking question*

Regarding to the above statement, it was revealed that 47% of the students strongly agreed, 24% agreed, 6% undecided, 4% disagreed and 19% strongly disagreed with the statement. The weighted average 3.74 which is within the range of 4.5 and 3.5 indicate that the respondents agreed with the statement that they feel comfortable in asking question with no female students in the class, their responses are statistically significant and their opinion are of high confidence. The significant value 0.000 level which is less than alpha of 0.05 (p<0.05) means that the responses on this statement are not statistically significant which means the null hypothesis is rejected. And the opinion of the respondents on this statement were accepted which is statistically significant.

iii.   *The SGI class motivates me to prepare well in making good presentation in the class*

From table 4.14 it was depicted that SGI class motivates students to prepare well in making good presentation in the class, 34% of the students strongly agreed, 15% agreed, 15% undecided, 17% disagreed and 19% strongly disagreed with the statement. The weighted average 3.28 which is within the range of 2.5 and 3.5 that is; the opinions were uncertain, however the significant value 0.193 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this

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statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that SGI class does not motivate students to prepare well in making good presentation in the class.

iv.   In a SGI I frequently participate in classroom conversation with the lecturer

For the opinions of the respondents on the statement that in a SGI class students frequently participate in classroom conversation with the lecturer, 36% of the students strongly agreed, 22% agreed, 15% undecided, 7% disagreed and 19% strongly disagreed with the statement. The weighted average 3.50 which is within the range of 4.5 and 3.5 indicate that the respondents agreed with the statement that they frequently participate in classroom conversation with the lecturer in Single-gender class, their responses are statistically significant and their opinion are of high confidence. The significant value 0.023 level which is less than alpha of 0.05 (p<0.05) means that the responses on this statement are not statistically significant which means that the null hypothesis is rejected. And the opinion of the respondents on this statement were accepted which is statistically significant.

v.   Due to absence of Female students in the class I enjoy working in a group project or assignment

Regarding the opinions of the respondents that students enjoy working in a group project or assignment due to absence of Female students in the class, 47% of the students strongly agreed, 13% agreed, 19% undecided, 8% disagreed and 13% strongly disagreed with the statement. The weighted average 3.72 which is within the range of 4.5 and 3.5 indicate that the respondents agreed with the statement they enjoy working in a group project or assignment due to absence of Female students in the class, their responses are statistically significant and their opinion are of high confidence. The significant value 0.000 level which is less than alpha of 0.05 (p<0.05) means that the responses on this statement are not statistically significant which means the null hypothesis is rejected. And the opinion of the respondents on this statement were accepted which is statistically significant.

vi. ***In a SGI class I'm more attentive and discipline during the instruction***

Regarding students being more attentive and discipline during instruction in a SGI class, 28% of the students strongly agreed, 21% agreed, 19% undecided, 11% disagreed and 21% strongly disagreed with the statement. The weighted average 3.23 which is within the range of 3.5 and 2.5 that is; the opinions were uncertain, however the significant value 0.473 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that SGI class is not the factor which make students to be more attentive and discipline during instruction.

vii. ***Absence of Female students in the class boost my effort to participate in extra-curricular activities frequently***

In respect to the above statement, 19% of the students strongly agreed, 19% agreed, 13% undecided, 19% disagreed and 30% strongly disagreed with the statement. The weighted average 2.79 which is within the range of 3.5 and 2.5 that is; the opinions were uncertain, however the significant value 0.473 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that absence of female students in the class is not the factor which boost students effort to participate in extra-curricular activities frequently.

viii. ***In a SGI class I feel free in using electronic medium to discuss with other colleagues or to circulate information***

In respect to the above statement, 34% of the students strongly agreed, 17% agreed, 15% undecided, 9% disagreed and 25% strongly disagreed with the statement. The weighted average 3.26 which is within the range of 3.5 and 2.5 that is; the opinions were uncertain, however the significant value 0.055 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that SGI class is not the factor which make students to feel free in using electronic medium to discuss with other colleagues or to circulate information.

ix.   *In a SGI class I usually have serious conversations with students of a different race or ethnicity*

Regarding the opinion of the respondents that students usually have serious conversations with other students of a different race or ethnicity in a SGI class, 32% of the students strongly agreed, 13% agreed, 23% undecided, 17% disagreed and 15% strongly disagreed with the statement. The weighted average 3.30 which is within the range of 3.5 and 2.5 that is; the opinions were uncertain, however the significant value 0.226 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that SGI class is not the factor that make students to have serious conversations with other students of a different race or ethnicity.

x.   *A SGI class is the better environment for acquiring knowledge*

Regarding the opinions of the respondents that a SGI class is the better environment for acquiring knowledge, 42% of the students strongly agreed, 23% agreed, 11% undecided, 11% disagreed and 13% strongly disagreed with the statement. The weighted average 3.72 which is within the range of 4.5 and 3.5 indicate that the respondents agreed with the statement that a SGI class is the better environment for acquiring knowledge, their responses are statistically significant and their opinion are of high confidence. The significant value 0.001 level which is less than alpha of 0.05 (p<0.05) means that the responses on this statement are not statistically significant which means the null hypothesis is rejected. And the opinion of the respondents on this statement were accepted which is statistically significant.

xi.   *In conclusion, Female students are the sunlight (Beauty) of the campus*

Regarding the last item statement in Table 4.14; Female students are the sunlight (beauty) of the campus, 17% of the students strongly agreed, 17% agreed, 25% undecided,9% disagreed and 32% strongly disagreed with the statement. The weighted average 2.79 which is within the range of 3.5 and 2.5 that is; the opinions were uncertain, however the significant value 0.108 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the

respondents on this statement were rejected which means that female students are not the ones who beautify the campus.

Section C: Students' Social and Personal Development

The table 4.15 below shows the analysis for students' social and personal development. The tittle columns represent the item statement, four point scale and its corresponding values, where Very often = [VO] 4, Often [O] = 3, Sometimes [ST] = 2, Never [N] = 1, respectively and weighted average (W.A). The figures in the parenthesis indicate percentages and f represent the frequency while the (s-value) represent the significant value obtained from the Chi-square test.

Table 4.15Analyses of students' Social and Personal Development

Item statement		4[VO]	3[O]	2ST	1[N]	W.A	s-value
Students in a Single-gender class are usually more engaged in debates and discussions related to social critique and change than students in coed class.	f	11	16	13	7	2.66	0.303
	%	(23)	(34)	(28)	(15)		
Students in a Single-gender class are usually more active in questioning and challenging their own thinking than students in coed class.	f	13	17	10	7	2.77	0.198
	%	(28)	(36)	(21)	(15)		
Students in a Single-gender class are frequently making connections between classroom instruction and their own experiences than students in coed class.	f	10	19	8	10	2.62	0.103
	%	(21)	(41)	(17)	(21)		
Students in a Single-gender class are better engaged in voluntary service in the society than students in coed class.	f	13	13	13	8	2.66	0.660
	%	(28)	(28)	(28)	(16)		

In respect to Table 4.15 above, the researcher identified four (4) item statements in determining the students' social and personal development in the study area of which the results were analyzed and interpreted thus:

i. *Students in a SGI class are usually more engaged in debates and discussions related to social critique and change than students in CEI class*

Regarding to the above statement, 23% of the respondents said very often, 34% said often, 28% said sometimes and 15% said never to the statement. The weighted average 2.66 which is within the range of 3.5 and 2.5 that is; the opinions were often, however the significant value 0.303 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that students in SGI class are not usually more engaged in debates and discussions related to social critique and change than students in CEI class.

ii. *Students in a SGI class are usually more active in questioning and challenging their own thinking than students in CEI class*

Regarding the opinions of the respondents that Students in a SGI class are usually more active in questioning and challenging their own thinking than students in CEI class, 28% of the respondents said very often, 36% said often, 21% said sometimes and 15% said never to the statement. The weighted average 2.77 which is within the range of 3.5 and 2.5 that is; the opinions were often, however the significant value 0.198 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that students in SGI class are not usually more active in questioning and challenging their own thinking than students in CEI class.

iii. *Students in a SGI class are frequently making connections between classroom instruction and their own experiences than students in CEI class*

In respect to the above statement, 21% of the respondents said very often, 41% said often, 17% said sometimes and 21% said never to the statement. The weighted average 2.62 which is within the range of 3.5 and 2.5 that is; the opinions were often, however the significant value 0.103 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that students in SGI

class are not frequently making connections between classroom instruction and their own experiences more than students in CEI class.

> ### *iv.   Students in a SGI class are better engaged in voluntary service in the society than students in CEI class*

Regarding the last item statement in Table 4.15; Students in a SGI class are better engaged in voluntary service in the society than students in CEI class, 28% of the respondents said very often, 28% said often, 28% said sometimes and 16% said never to the statement. The weighted average 2.66 which is within the range of 3.5 and 2.5 that is; the opinions were often, however the significant value 0.660 level is greater than alpha value of 0.05 ($p>0.05$) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that students in SGI class are not better engaged in voluntary service in the society than students in CEI class.

4.3.2 Students' level of interaction in CEI
Section A: Students' Background Information

The 85 respondents were 68 (80%) male and 17 (20%) female students who receive instruction in CEI classroom. The majority (91%) of the students were between 19-22 years old. In respect to the question asked to describe the higher secondary school/Collage they attended, 42.4% of participants attended public secondary schools/collages, 57.6% attended private higher secondary schools.

When asked to describe their higher secondary school classes, majority (37.6%) of the students describe their higher secondary school classes as single gender classes, 43.5% of the students describe their higher secondary school Co-Ed classes and 18.8% of the students describe their higher secondary school/collage classes as mixed classes.

When asked about the reasons for attending IUT, the majority of students reported choosing IUT because of its academic reputation, their parents choose the university for them and they also like the campus (See Fig. 4.11).

When asked to mark each of the activities they spent more than an hour doing every day in IUT, the most commonly reported answer was Facebook/twitter, followed by studying/homework, socializing with friends and watching TV/movies (see Fig. 4.12).

Number of responses %
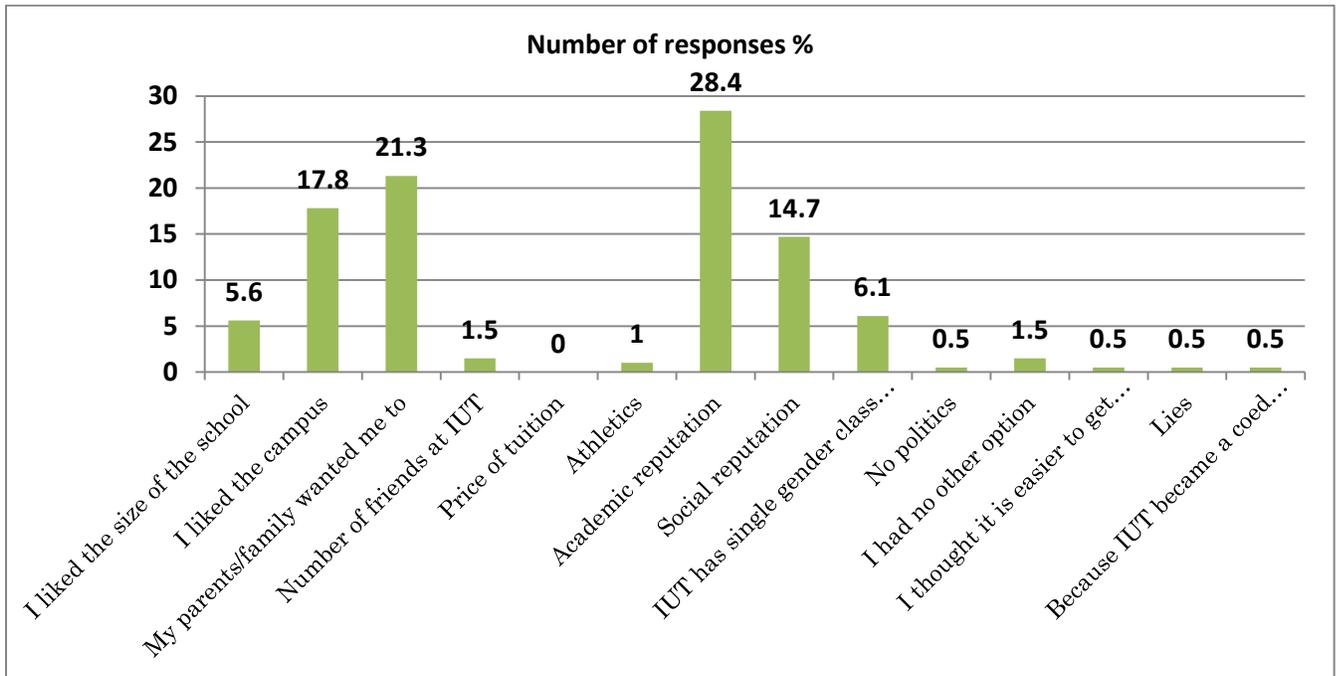
Figure 4.11 Factors influencing students to choose IUT

Number of responses %
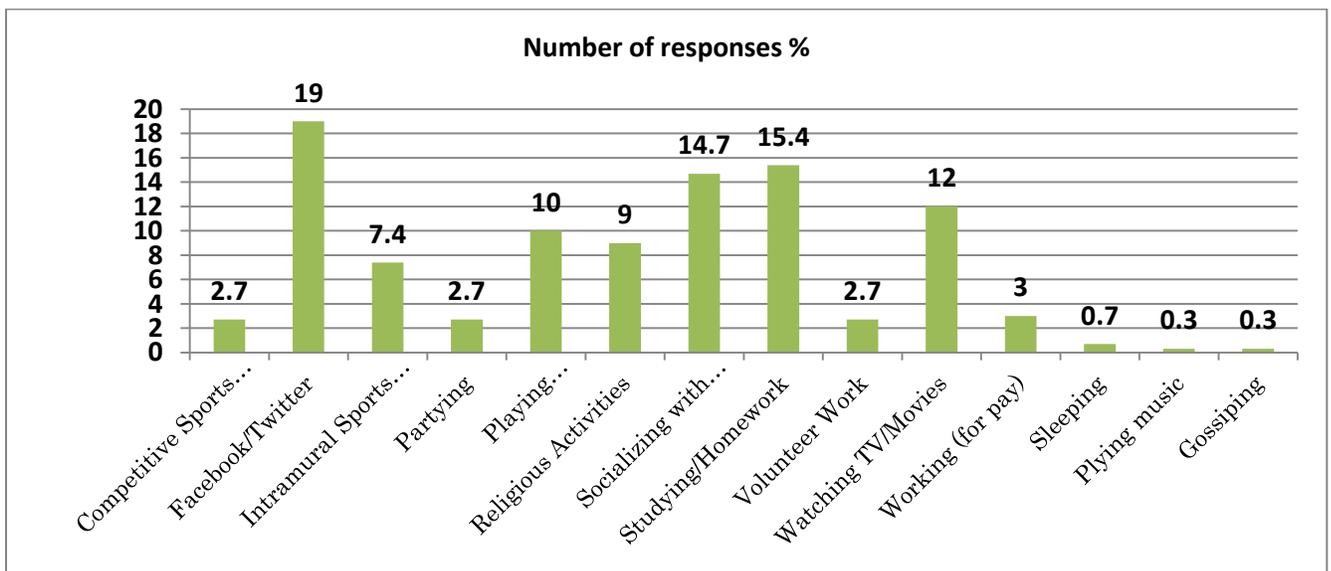
Figure 4.12 the activities students' spent more time doing per day in IUT

Section B: Students Classroom Experience

The table 4.16 below shows the analysis for students' classroom experience. The tittle columns represent the item statement, five point scale and its corresponding values, where strongly agree (SA)=5, Agree (A)=4, undecided (U)=3, disagree (D)=2, strongly disagree (SD)=1 respectively, and weighted average (W.A). The figures in the parenthesis indicate percentages and f represent the frequency while the (s-value) represent the significant value obtained from the Chi-square test.

Table 4.16Analyses of students' classroom experience

Item statement		5(SA)	4(A)	3(U)	2(D)	1(SD)	W.A	s-value
Being in a Co-Ed class encourages me to be well prepared for quizzes and exams	f	14	13	27	10	21	2.87	0.025
	%	(16)	(15)	(32)	(12)	(25)		
Because there are male/female students in the class I feel comfortable in asking question	f	10	11	22	17	25	2.58	0.037
	%	(12)	(13)	(26)	(20)	(29)		
The Co-Ed class motivates me to prepare well in making good presentation in the class	f	21	27	13	9	15	3.35	0.019
	%	(25)	(32)	(15)	(11)	(17)		
In a Co-Ed class I frequently participate in classroom conversation with the lecturer	f	9	23	16	17	20	2.81	0.167
	%	(11)	(27)	(19)	(20)	(23)		
Due to presence of male/female students in the class I enjoy working in a group project or assignment	f	16	19	21	7	22	3.00	0.072
	%	(19)	(22)	(25)	(8)	(26)		
In a Co-Ed class I'm more attentive and discipline during the instruction	f	13	18	26	11	17	2.99	0.096
	%	(15)	(21)	(31)	(13)	(20)		
Presence of male/female students in the class boosts my effort to participate in extra-curricular activities (debate competition, robotic competition, symposium, project showcasing, business idea etc.) frequently	f	16	11	15	19	23	2.74	0.307
	%	(19)	(13)	(18)	(22)	(27)		
In a Co-Ed class I feel free in using electronic medium (Facebook, Whatsapp, Twitter, YouTube,, Skype, Viber etc.) to discuss with other colleagues or to	f	12	17	26	11	18	2.93	0.075
	%	(14)	(20)	(31)	(13)	(21)		

circulate information							
In a Co-Ed class I usually have serious conversations with students of a different race or ethnicity	f	11	19	20	17	16	2.90	0.564
	%	(13)	(22)	(24)	(20)	(19)		
A Co-Ed class is the better environment for acquiring knowledge	f	19	18	22	8	18	3.14	0.159
	%	(23)	(21)	(26)	(9)	(21)		
In conclusion, female students are the sunlight (Beauty) of the campus	f	23	8	12	11	30	2.80	0.000
	%	(27)	(10)	(14)	(13)	(35)		

In respect to Table 4.16 above, the researcher identified eleven (11) item statements in determining the students' classroom experience in the study area of which the results were analyzed and interpreted below:

i.   Being in a CEI class encourages me to be well prepared for quizzes and exams

Regarding to the above statement, 16% of the respondents strongly agreed, 15% agreed, 32% undecided, 12% disagreed and 25% strongly disagreed with the statement. The weighted average 2.87 which is within the range of 2.5 and 3.5 that is; the opinions were uncertain, however the significant value 0.025 level is less than alpha value of 0.05 (p<0.05) means that the responses on this statement are not statistically significant which means the null hypothesis is rejected. And the opinions of the respondents on this statement were accepted which is statistically significant.

ii.   Because there are male/female students in the class I feel comfortable in asking question

With regard to the above statement, it was revealed that 12% of the students strongly agreed, 13% agreed, 26% undecided, 20% disagreed and 29% strongly disagreed with the statement. The weighted average 2.58 which is within the range of 3.5 and 2.5 that is; the opinions were uncertain, however the significant value 0.037 level is less than alpha value of 0.05 (p<0.05) means that the responses on this statement are not statistically significant which means the null hypothesis is rejected. And the opinions of the respondents on this statement were accepted which means that students feel comfortable in asking question when there are male/female students in the class.

iii.   ***The CEI class motivates me to prepare well in making good presentation in the class***

From table 4.16 it was depicted that CEI class motivate students to prepare well in making good presentation in the class, 25% of the students strongly agreed, 32% agreed, 15% undecided, 11% disagreed and 17% strongly disagreed with the statement. The weighted average 3.35 which is within the range of 3.5 and 2.5 that is; the opinions were uncertain, however the significant value 0.019 level is less than alpha value of 0.05 (p<0.05) means that the responses on this statement are not statistically significant which means the null hypothesis is rejected. And the opinions of the respondents on this statement were accepted which means that CEI class motivate students to prepare well in making good presentation in the class.

iv.   ***In a CEI I frequently participate in classroom conversation with the lecturer***

For the opinions of the respondents on the statement that in a CEI class students frequently participate in classroom conversation with the lecturer, 11% of the students strongly agreed, 27% agreed, 19% undecided, 20% disagreed and 23% strongly disagreed with the statement. The weighted average 2.81 which is within the range of 3.5 and 2.5 that is; the opinions were uncertain, however the significant value 0.167 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that students does not frequently participate in classroom conversation with lecturer in CEI class.

v.   ***Due to presence of male/female students in the class I enjoy working in a group project or assignment***

Regarding the opinions of the respondents that students enjoy working in a group project or assignment due to presence of male/female students in the class, 19% of the students strongly agreed, 22% agreed, 25% undecided, 8% disagreed and 26% strongly disagreed with the statement. The weighted average 3.00 which is within the range of 3.5 and 2.5 that is; the opinions were uncertain, however the significant value 0.072 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this

statement were rejected which means that students does not enjoy working in a group project or assignment due to presence of male/female students in the class.

vi. In a CEI class I'm more attentive and discipline during the instruction

Regarding students being more attentive and discipline during instruction in a CEI class, 15% of the students strongly agreed, 21% agreed, 31% undecided, 13% disagreed and 20% strongly disagreed with the statement. The weighted average 2.99 which is within the range of 2.5 and 3.5 that is; the opinions were uncertain, however the significant value 0.096 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that CEI class is not the factor which make students to be more attentive and discipline during instruction.

vii. Presence of male/female students in the class boost my effort to participate in extra-curricular activities frequently

In respect to the above statement, 19% of the students strongly agreed, 11% agreed, 15% undecided, 19% disagreed and 23% strongly disagreed with the statement. The weighted average 2.74 which is within the range of 3.5 and 2.5 that is; the opinions were uncertain, however the significant value 0.307 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that presence of male/female students in the class is not the factor which boost students effort to participate in extra-curricular activities frequently.

viii. In a CEI class I feel free in using electronic medium to discuss with other colleagues or to circulate information

In respect to the above statement, 14% of the students strongly agreed, 20% agreed, 31% undecided, 13% disagreed and 21% strongly disagreed with the statement. The weighted average 2.93 which is within the range of 3.5 and 2.5 that is; the opinions were uncertain, however the significant value 0.075 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail

to reject and the opinions of the respondents on this statement were rejected which means that CEI class is not the factor which make students to feel free in using electronic medium to discuss with other colleagues or to circulate information.

ix. In a CEI class I usually have serious conversations with students of a different race or ethnicity

Regarding the opinion of the respondents that students usually have serious conversations with other students of a different race or ethnicity in a CEI class,13% of the students strongly agreed, 22% agreed, 24% undecided, 20% disagreed and 19% strongly disagreed with the statement. The weighted average 2.90 which is within the range of 3.5 and 2.5 that is; the opinions were uncertain, however the significant value 0.564 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that CEI class is not the factor that make students to have serious conversations with other students of a different race or ethnicity.

x. A CEI class is the better environment for acquiring knowledge

Regarding the opinions of the respondents that a CEI class is the better environment for acquiring knowledge, 23% of the students strongly agreed, 21% agreed, 26% undecided, 9% disagreed and 21% strongly disagreed with the statement. The weighted average 3.14 which is within the range of 3.5 and 2.5 that is; the opinions were uncertain, however the significant value 0.159 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that CEI class is not better environment for acquiring knowledge.

xi. *In conclusion, Female students are the sunlight (Beauty) of the campus*

Regarding the last item statement in Table 4.16; Female students are the sunlight (beauty) of the campus, 27% of the students strongly agreed, 10% agreed, 14% undecided, 13% disagreed and 35% strongly disagreed with the statement. The weighted average 2.80 which is within the range of 3.5 and 2.5 that is; the opinions were uncertain, however the significant value 0.000 level is less than alpha value of 0.05 ($p<0.05$) means that the responses on this statement are not statistically significant which means the null hypothesis is rejected. And the opinions of the respondents on this statement were accepted which means that Female students are the sunlight (beauty) of the campus.

Section C: Students' Social and Personal Development

The table 4.17 below shows the analysis for students' social and personal development. The tittle columns represent the item statement, four point scale and its corresponding values where Very often = [VO] 4, Often [O] = 3, Sometimes [ST] = 2, Never [N] = 1, respectively and weighted average (W.A). The figures in the parenthesis indicate percentages and f represent the frequency while the (s-value) represent the significant value obtained from the Chi-square test.

Table 4.17 Analyses of students' Social and Personal Development

Item statement		4[VO]	3[O]	2ST	1[N]	W.A	s-value
Students in a coed class are usually more engaged in debates and discussions related to social critique and change than students in Single-gender class.	f	*15*	*22*	*32*	*16*	*2.42*	*0.035*
	%	*(18)*	*(26)*	*(37)*	*(19)*		
Students in coed class a are usually more active in questioning and challenging their own thinking than students in Single-gender class.	f	*22*	*27*	*21*	*15*	*2.66*	*0.331*
	%	*(26)*	*(32)*	*(25)*	*(17)*		
Students in coed class are frequently making connections between classroom instruction and their own experiences than students in a Single-gender class.	f	*22*	*20*	*23*	*19*	*2.54*	*0.924*
	%	*(26)*	*(24)*	*(27)*	*(22)*		
Students in coed class are better engaged in voluntary service in the society than	f	*26*	*21*	*21*	*17*	*2.66*	*0.590*
	%	*(30)*	*(25)*	*(25)*	*(20)*		

In respect to Table 4.17 above, the researcher identified four (4) item statements in determining the students' social and personal development in the study area of which the results were analyzed and interpreted thus:

i. *Students in a CEI class are usually more engaged in debates and discussions related to social critique and change than students in SGI class*

Regarding to the above statement, 18% of the respondents said very often, 26% said often, 37% said sometimes and 19% said never to the statement. The weighted average 2.42 which is within the range of 2.5 and 1.5 that is; the opinions were sometimes, however the significant value 0.035 level is less than alpha value of 0.05 (p<0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis is rejected and the opinion of the respondents on this statement were accepted which means that students in CEI class are usually more engaged in debates and discussions related to social critique and change than students in SGI class.

ii. *Students in a CEI class are usually more active in questioning and challenging their own thinking than students in SGI class*

Regarding the opinions of the respondents that Students in a CEI class are usually more active in questioning and challenging their own thinking than students in SGI class, 26% of the respondents said very often, 32% said often, 25% said sometimes and 17% said never to the statement. The weighted average 2.66 which is within the range of 3.5 and 2.5 that is; the opinions were often, however the significant value 0.331 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that students in CEI class are not usually more active in questioning and challenging their own thinking than students in SGI class.

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iii. *Students in a CEI class are frequently making connections between classroom instruction and their own experiences than students in SGI class*

In respect to the above statement, 26% of the respondents said very often, 24% said often, 27% said sometimes and 22% said never to the statement. The weighted average 2.52 which is within the range of 3.5 and 2.5 that is; the opinions were often, however the significant value 0.924 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that students in CEI class are not frequently making connections between classroom instruction and their own experiences more than students in SGI class.

iv. *Students in a CEI class are better engaged in voluntary service in the society than students in SGI class*

Regarding the last item statement in Table 4.14; Students in a CEI class are better engaged in voluntary service in the society than students in SGI class, 30% of the respondents said very often, 25% said often, 25% said sometimes and 20% said never to the statement. The weighted average 2.66 which is within the range of 3.5 and 2.5 that is; the opinions were often, however the significant value 0.590 level is greater than alpha value of 0.05 (p>0.05) which means that the responses on this statement are not statistically significant which means the null hypothesis fail to reject and the opinions of the respondents on this statement were rejected which means that students in CEI class are not better engaged in voluntary service in the society than students in SGI class.

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CHAPTER FIVE
SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATION

</div>

5.0 Introduction

This chapter discuss about the summary, findings, conclusion and recommendations of the study.

5.1 Summary

The purpose of this study is to compare engineering students' performance between Single-Gender classroom (SGI) and Co-Ed classroom (CEI) in Islamic university of technology (IUT).

The study was based on the following objectives;

   i.   To find out if there is any significant difference in academic performance of IUT students, between Single- Gender and Co-Ed classes.
   ii.   To identify the difference in student's level of interaction between Co-Ed and Single-Gender classrooms.

The targeted population was the students of Islamic University of Technology (IUT) who were studying in undergraduate level. The sample size according to the data collected up to 756 students from both Single-gender (268 Student's enrolled in 2015/2016 academic session) which consist of only male students and Co-Ed classes (488 Student's enrolled in 2016/2017 academic session) which comprises of both male and female students.

To compare the students' academic performance, student's t-test with unequal variance was applied to find out if there is any significance differences between the groups (SGI and CEI classes). And also a chi-square test was conducted to find out the difference in students' level of interaction. All the analysis was done by using SPSS V.20.

5.2 Findings

5.2.1 Difference in academic performance between SGI and CEI
The result shows from the analyses of first semester academic performance and academic failure that there is no significant difference between SGI and CEI classroom. The second semester academic performance analysis shows that the students in SGI perform better than those in CEI and also the same in academic failure.

The study further to analyze the academic performance and failure of male and female students receiving instruction in CEI classroom, after analyzing their academic performance and academic failure of both semesters, the research found out a significant difference between them. The female students perform better than male students in both semesters regarding academic performance and academic failure.

The findings in respect to the first research objective shows that male students perform better academically in SGI classes in contrary to their academic performance in CEI classes. Thus, SGI could be a more favorable environment for male students than CEI environment.

5.2.2 Difference in students' level of interaction between SGI and CEI
The findings on the second research objectives to find out the difference in students level of interaction will be seen below:

Section B: Students Classroom Experience

    i.   Class encouragement to be well prepared for quizzes and exams

The findings of the study reveal that most of the students who receive instruction in both SGI and CEI class are encourage by their respective classes in making good preparation for quizzes and exams, which shows that they have no difference in respect to the above statement.

    ii.   Students comfort in asking question in the class

It was found that most of the students who receive instruction in both SGI and CEI class feel comfortable in asking question, thus the findings show no difference in the above statement in respect to difference in class environment.

iii. *Class motivation in making good preparation*

The findings reported that most of the students who receive instruction in CEI class are motivated to prepare well in making good presentation in the class but on the contrary the students in SGI class are not motivated to prepare well in making good presentation in the class. Thus, the findings show difference in the above statement between the two groups.

iv. *Participation in classroom conversation with the lecturer*

The study found that most of the students who receive instruction in SGI class frequently participate in classroom conversation with the lecturer more often than those students who receive instruction in CEI class. Thus, the findings show difference in the above statement between the two groups.

v. *Students enjoy working in a group project or assignment*

The findings of the study reveal that most of the students who receive instruction in SGI class enjoy working in a group project or assignment more often than those students who receive instruction in CEI class. Thus, the findings show difference in the above statement between the two groups.

vi. *Classroom discipline during instruction*

It was found that students discipline during instruction is not influenced by the type of class environment. The findings show that most of the students who receive instruction in both SGI and CEI classes do not believe that the classroom environment (SGI or CEI) became a factor which imposes discipline and attentiveness during instruction.

vii. *Participation in extra-curricular activities*

The findings reported that being in SGI or CEI class is not the factor which influences the students in boosting their effort to participate in extra-curricular activities such as debate competition, robotic competition, symposium, project showcasing, business idea etc. Thus, the findings show no difference in the above statement in respect to difference in class environment.

viii.   *Using electronic medium to discuss with other colleagues or to circulate information*

The study found that classroom environment (SGI or CEI) is not the factor which made students to feel free in using electronic medium (Email, Facebook, WhatsApp, Twitter, YouTube, Skype, Viber etc.) to discuss with other colleagues or to circulate information. Thus, the findings show no difference in the above statement in respect to difference in class environment.

ix.   *Classroom conversation with students of a different race or ethnicity*

The findings of the study reveal that classroom environment (SGI or CEI) is not the factor which has influence on the students in having serious conversation more often with other students of different race or ethnicity. Thus, the findings show no difference in the above statement in respect to difference in class environment.

x.   *Better classroom environment for acquiring knowledge*

The study found that SGI class is more of a better environment for acquiring knowledge than CEI class. Most of the students who receive instruction in SGI class believe that SGI class is the better classroom environment for acquiring knowledge while most of the students who receive instruction in CEI class have the opinion that CEI class is not a better environment for acquiring knowledge. Thus, the findings show difference in the above statement between the two groups.

xi.   *Female students are the beauty of the campus*

The findings reported that most of the students who receive instruction in CEI class believe that female students are the ones who beautify the campus, which is on the contrary to the opinion of students who receive instruction in SGI class. Thus, the findings show difference in the above statement between the two groups.

Section C: Students' Social and Personal Development

i.   Students engagement in debate and discussions related to social critique and change

The findings of the study reveal that students who receive instruction in CEI class are usually more engaged in debates and discussions related to social critique and change than students who receive instruction in SGI class. Thus, the findings show difference in the above statement between the two groups.

ii.   Students questioning and challenging their own opinion

The findings reported that being in SGI or CEI class is not the factor which influences the students in becoming more active in questioning and challenging his/her own opinion. Thus, the findings show no difference in the above statement in respect to difference in class environment between the two groups.

iii.   Students making connections between classroom instruction and their own experience

It was found that being in SGI or CEI class is not the factor which influences the students in making connection between classroom instruction and their own experience frequently. Thus, the findings show no difference in the above statement in respect to difference in class environment between the two groups.

iv.   Students engagement in voluntary service in the society

The findings of the study reveal that classroom environment (SGI or CEI) is not the factor which influences students to be more enthusiastic to engage in voluntary service in the society. Thus, the findings show no difference in the above statement in respect to difference in class environment between the two groups.

5.3 Conclusion

Classroom coordination has a great influence on student's achievement; several numbers of debates from different angles around the world have been made about the impact of classroom arrangement on the performance of students. Some scholars are proponents on single-gender classroom performs better in instructional settings, while others contradict it with their own point that coed classroom performs better in instructional settings.

The jury is still out on the issue of classroom gender composition. Since 1830, during the American Revolution era, when coeducation was first proposed, there has been a strong debate over whether boys and girls should learn in the same classroom (Graebner, 2006). The current, most widely-accepted school of thought is that single-gender instruction SGI is best for girls, while co-ed CEI is better for boys, even to the extent of influencing parents in their decision on what type of school to enroll their children in (Jackson & Bisset, 2005).

In respect to the findings the following conclusions can be drawn:

- Students who receive instruction in CEI class are more motivated to prepare well in making good presentation in the class than students who receive instruction in SGI class.
- Students who receive instruction in CEI class are usually more engaged in debates and discussions related to social critique and change than students who receive instruction in SGI class.
- On the other hand, students who receive instruction in SGI class frequently participate in classroom conversation with the lecturer more often than those students who receive instruction in CEI class.
- Students who receive instruction in SGI class enjoy working in a group project or assignment more often than those students who receive instruction in CEI class.
- The study also found that male students perform better academically in SGI classes in contrary to their academic performance in CEI classes. Thus, SGI could be a more favorable environment for male students than CEI environment.

5.4 Recommendation

This study investigated students' academic performance between SGI and CEI classroom. However, due to time and resource constrain the undergraduate students of two academic session (SGI class and CEI class) were taking as sample and only their first and second semester academic performance were used to compare between the two groups. It could be better if the number of semesters could be increased in comparison and also to compare the students' placement exam into the university.

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ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)

Department of Technical and Vocational Education (TVE)

Online Survey Questionnaire

Introduction:

I am a Master student of Islamic University of Technology (IUT) in Technical and Vocational Education (TVE) Department. As a partial requirement of this degree, I am conducting a survey to make **a *comparative study on engineering student's performance between single-gender classroom and coed classroom in Islamic University of technology (IUT)***. I will appreciate if you could complete the following sections.

NOTE: It's under ethical requirement that all your personal information will be kept confidential and also your honest response will have serious impact on this research and will be highly appreciated.

Terminologies Used:

Single-Gender Classroom: This is the type of classroom which consist of single-gender, either male or female receiving instruction.

Co-ed Classroom: This is the type of classroom which comprises of mixed-gender, both male and female receiving instruction.

Respondent's Details:

Age:-…………………   Gender: - Male ☐ Female ☐ Nationality:-……………

Program: - BSc-Eng. ☐   HD-Eng. ☐   Department:-………………………

<u>Researcher</u>

Faruq Bashir Iron-Baba

Student No: 161031102

MScTE Student

Department of Technical and Vocational Education (TVE)

Islamic University of Technology (IUT), Board Bazar, Gazipur-1704, Bangladesh

APPENDIX B

Co-Ed Class (2016/2017 session)

This survey questionnaire consists of 3 sections:

Section A: Students Related Background Information

Section B: Students Classroom Experience

Section C: Students Social and Personal Development

Section A: Students Related Background Information

1. Please select the option that best describes the higher secondary school/Collage you attended?
   a) Public
   b) Private

2. Please mark the option that best describes your higher secondary/Collage school classes:
   a) Co-ed classes
   b) Single-Gender classes
   c) Mixed

3. Please mark those factors that influenced your decision to come to IUT.
   a) I liked the size of the school
   b) I liked the campus
   c) My parents/family wanted me to
   d) Number of friends at IUT
   e) Price of tuition
   f) Athletics
   g) Academic reputation
   h) Social reputation
   i) IUT has single gender class environment

4. Please indicate the activities for which you use to spend more than an hour doing every day in IUT:
   a) Competitive Sports (sport outside campus)
   b) Facebook/Twitter
   c) Intramural Sports (sports inside campus)
   d) Partying
   e) Playing Video/Computer Games

f) Religious Activities
g) Socializing with Friends
h) Studying/Homework
i) Volunteer Work
j) Watching TV/Movies
k) Working (for pay)

Section B: Students Classroom Experience

Direction: Please tick ( ) each row in the following table, apply the scale below

[**1**] Strongly Disagree, [**2**] Disagree, [**3**] Undecided, [**4**] Agree [**5**] Strongly Agree

S/N	Statement	1	2	3	4	5
1.	Being in a Coed class encourages me to be well prepared for quizzes and exams					
2.	Because there are Female/Male students in the class I feel comfortable in asking question					
3.	The Coed class motivates me to prepare well in making good presentation in the class					
4.	In a Coed class I frequently participate in classroom conversation with the lecturer					
5.	Due to presence of Female/Male students in the class I enjoy working in a group project or assignment					
6.	In a Coed class I'm more attentive and discipline during the instruction					
7.	Presence of Female/Male students in the class boost my effort to participate in extra-curricular activities (debate competition, robotic competition, symposium, project showcasing, business idea etc.) frequently					
8.	In a Coed class I feel free in using electronic medium (Facebook, Whatsapp, Twitter, YouTube, Google, Skype, Viber etc.) to discuss with other colleagues or to circulate information					
9.	In a Coed class I usually have serious conversations with students of a different race or ethnicity					
10.	A Coed class is the better environment for acquiring knowledge					
11.	In conclusion, Female students are the sunlight of the campus					

Section C: Students Social and Personal Development

Direction: Express your opinion by ticking ( ) each row in the following table, apply the scale below

[**1**] Never [**2**] Sometimes [**3**] Often [**4**] Very often

S/N	Statement	1	2	3	4
1.	Students in a Coed class are usually more engaged in debates and discussions related to social critique and change than students in Single-gender class.				
2.	Students in a Coed class are usually more active in questioning and challenging their own thinking than students in Single-gender class.				
3.	Students in a Coed class are frequently making connections between classroom instruction and their own experiences than students in Single-gender class.				
4.	Students in a Coed class are better engaged in voluntary service in the society than students in Single-gender class.				

Thank you for your sincere cooperation.

Single-Gender Class (2015/2016 session)

This survey questionnaire consists of 3 sections:

Section A: Students Related Background Information

Section B: Students Classroom Experience

Section C: Students Social and Personal Development

Section A: Students Related Background Information

1. Please select the option that best describes the higher secondary school/Collage you attended?
   c) Public
   d) Private

2. Please mark the option that best describes your higher secondary/Collage school classes:
   d) Co-ed classes
   e) Single-Gender classes
   f) Mixed

3. Please mark those factors that influenced your decision to come to IUT.
   j) I liked the size of the school
   k) I liked the campus
   l) My parents/family wanted me to
   m) Number of friends at IUT
   n) Price of tuition
   o) Athletics
   p) Academic reputation
   q) Social reputation
   r) IUT has single gender class environment

4. Please indicate the activities for which you use to spend more than an hour doing every day in IUT:
   l) Competitive Sports (sport outside campus)
   m) Facebook/Twitter
   n) Intramural Sports (sports inside campus)
   o) Partying
   p) Playing Video/Computer Games
   q) Religious Activities
   r) Socializing with Friends
   s) Studying/Homework

t) Volunteer Work
u) Watching TV/Movies
v) Working (for pay)

Section B: Students Classroom Experience

Direction: Please tick ( ) each row in the following table, apply the scale below

[**1**] Strongly Disagree, [**2**] Disagree, [**3**] Undecided, [**4**] Agree [**5**] Strongly Agree

S/N	Statement	1	2	3	4	5
1.	Being in a Single-gender class encourages me to be well prepared for quizzes and exams					
2.	Because there are no female students in the class I feel comfortable in asking question					
3.	The Single-gender class motivates me to prepare well in making good presentation in the class					
4.	In a Single-gender class I frequently participate in classroom conversation with the lecturer					
5.	Due to absence of Female students in the class I enjoy working in a group project or assignment					
6.	In a Single-gender class I'm more attentive and discipline during the instruction					
7.	Absence of Female students in the class boost my effort to participate in extra-curricular activities (debate competition, robotic competition, symposium, project showcasing, business idea etc.) frequently					
8.	In a Single-gender class I feel free in using electronic medium (Facebook, Whatsapp, Twitter, YouTube, Google, Skype, Viber etc.) to discuss with other colleagues or to circulate information					
9.	In a Single-gender class I usually have serious conversations with students of a different race or ethnicity					
10.	A Single-gender class is the better environment for acquiring knowledge					
11.	In conclusion, Female students are the sunlight of the campus					

Section C: Students Social and Personal Development

    Direction: Express your opinion by ticking ( ) each row in the following table, apply the scale below

    [**1**] Never [**2**] Sometimes [**3**] Often [**4**] Very often

S/N	Statement	1	2	3	4
1.	Students in a Single-gender class are usually more engaged in debates and discussions related to social critique and change than students in coed class.				
2.	Students in a Single-gender class are usually more active in questioning and challenging their own thinking than students in coed class.				
3.	Students in a Single-gender class are frequently making connections between classroom instruction and their own experiences than students in coed class.				
4.	Students in a Single-gender class are better engaged in voluntary service in the society than students in coed class.				

Thank you for your sincere cooperation.

APPENDIX C
Table of Critical Values for t test

Degrees of freedom	Significance level					
	20% (0.20)	10% (0.10)	5% (0.05)	2% (0.02)	1% (0.01)	0.1% (0.001)
1	3.078	6.314	12.706	31.821	63.657	636.619
2	1.886	2.920	4.303	6.965	9.925	31.598
3	1.638	2.353	3.182	4.541	5.841	12.941
4	1.533	2.132	2.776	3.747	4.604	8.610
5	1.476	2.015	2.571	3.365	4.032	6.859
6	1.440	1.943	2.447	3.143	3.707	5.959
7	1.415	1.895	2.365	2.998	3.499	5.405
8	1.397	1.860	2.306	2.896	3.355	5.041
9	1.383	1.833	2.262	2.821	3.250	4.781
10	1.372	1.812	2.228	2.764	3.169	4.587
11	1.363	1.796	2.201	2.718	3.106	4.437
12	1.356	1.782	2.179	2.681	3.055	4.318
13	1.350	1.771	2.160	2.650	3.012	4.221
14	1.345	1.761	2.145	2.624	2.977	4.140
15	1.341	1.753	2.131	2.602	2.947	4.073
16	1.337	1.746	2.120	2.583	2.921	4.015
17	1.333	1.740	2.110	2.567	2.898	3.965
18	1.330	1.734	2.101	2.552	2.878	3.922
19	1.328	1.729	2.093	2.539	2.861	3.883
20	1.325	1.725	2.086	2.528	2.845	3.850
21	1.323	1.721	2.080	2.518	2.831	3.819
22	1.321	1.717	2.074	2.508	2.819	3.792
23	1.319	1.714	2.069	2.500	2.807	3.767
24	1.318	1.711	2.064	2.492	2.797	3.745
25	1.316	1.708	2.060	2.485	2.787	3.725
26	1.315	1.706	2.056	2.479	2.779	3.707
27	1.314	1.703	2.052	2.473	2.771	3.690
28	1.313	1.701	2.048	2.467	2.763	3.674
29	1.311	1.699	2.043	2.462	2.756	3.659
30	1.310	1.697	2.042	2.457	2.750	3.646
40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
120	1.289	1.658	1.980	2.158	2.617	3.373
∞	1.282	1.645	1.960	2.326	2.576	3.291

APPENDIX D
Table of Critical Values of F 'Chi-square'

| Degrees of Freedom | Chi-Square (χ^2) Distribution — Area to the Right of Critical Value | | | | | | | |
	0.99	0.975	0.95	0.90	0.10	0.05	0.025	0.01
1	—	0.001	0.004	0.016	2.706	3.841	5.024	6.635
2	0.020	0.051	0.103	0.211	4.605	5.991	7.378	9.210
3	0.115	0.216	0.352	0.584	6.251	7.815	9.348	11.345
4	0.297	0.484	0.711	1.064	7.779	9.488	11.143	13.277
5	0.554	0.831	1.145	1.610	9.236	11.071	12.833	15.086
6	0.872	1.237	1.635	2.204	10.645	12.592	14.449	16.812
7	1.239	1.690	2.167	2.833	12.017	14.067	16.013	18.475
8	1.646	2.180	2.733	3.490	13.362	15.507	17.535	20.090
9	2.088	2.700	3.325	4.168	14.684	16.919	19.023	21.666
10	2.558	3.247	3.940	4.865	15.987	18.307	20.483	23.209
11	3.053	3.816	4.575	5.578	17.275	19.675	21.920	24.725
12	3.571	4.404	5.226	6.304	18.549	21.026	23.337	26.217
13	4.107	5.009	5.892	7.042	19.812	22.362	24.736	27.688
14	4.660	5.629	6.571	7.790	21.064	23.685	26.119	29.141
15	5.229	6.262	7.261	8.547	22.307	24.996	27.488	30.578
16	5.812	6.908	7.962	9.312	23.542	26.296	28.845	32.000
17	6.408	7.564	8.672	10.085	24.769	27.587	30.191	33.409
18	7.015	8.231	9.390	10.865	25.989	28.869	31.526	34.805
19	7.633	8.907	10.117	11.651	27.204	30.144	32.852	36.191
20	8.260	9.591	10.851	12.443	28.412	31.410	34.170	37.566
21	8.897	10.283	11.591	13.240	29.615	32.671	35.479	38.932
22	9.542	10.982	12.338	14.042	30.813	33.924	36.781	40.289
23	10.196	11.689	13.091	14.848	32.007	35.172	38.076	41.638
24	10.856	12.401	13.848	15.659	33.196	36.415	39.364	42.980
25	11.524	13.120	14.611	16.473	34.382	37.652	40.646	44.314
26	12.198	13.844	15.379	17.292	35.563	38.885	41.923	45.642
27	12.879	14.573	16.151	18.114	36.741	40.113	43.194	46.963
28	13.565	15.308	16.928	18.939	37.916	41.337	44.461	48.278
29	14.257	16.047	17.708	19.768	39.087	42.557	45.722	49.588
30	14.954	16.791	18.493	20.599	40.256	43.773	46.979	50.892