

**FULL LENGTH ARTICLE****The Effect of Interactive Teaching Approaches on Gender-Based Academic Achievement Disparity Alleviation: The Cases of Colleges of Teachers Education in Oromia National Regional State, Ethiopia**Bahiru Haile<sup>1</sup>

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**Abstract**

This study was conducted in Jimma and Nakamte College of Teachers Education. It was set to identify ranges of interactive teaching approaches that maximize students' learning engagement so as to alleviate gender-based academic achievement disparities. Three hundred twelve first year students were selected from colleges of social sciences and natural sciences. A two-way (two-by-three levels, which forms six combinations) factorial experimental research design was employed to investigate combinations of the approaches that enhance gender-based academic achievement parity. Each sampled class was randomly assigned to one of the combinations. Teacher trainers who had been offering courses for the selected classes were trained intensively on those intervention variables to maximize its effects. The study indicated that post-test average scores of male and female students significantly increased. Yet, females were more facilitated than males under these teaching approaches. Scheffe's post hoc tests verified that cooperative learning-small group seating, gender responsive pedagogy-small group seating, gender responsive pedagogy-whole class seating and teacher immediacy behaviour-whole class seating related combinations were found better effective approaches to improve learning engagement and then to combat gender-based academic achievement disparity. Therefore, teachers are needed to maintain balance and to deepen their skills of gender responsive pedagogy. Besides, cooperative learning, teachers' immediacy behaviors, classroom setting and management need critical attention to alleviate gender-based academic achievement disparity.

**Key terms:** /cooperative learning & classroom setting/Gender responsive pedagogy/ Teachers' immediacy behavior/

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## 1. Introduction

### 1.1. Background to the Study

Education is a basic human right which is exercised by everyone irrespective of any background to excel in career competencies. It is often regarded as a systematic action of imparting relevant knowledge, skills and attitude to learners in their preparation for meaningful life and contribution to better society. In this regard, girls' education is a key to enhance their personal and family life as well as the social and economic development of the entire nation (UNESCO, 2015).

The educational millennium development goals require all ratifying countries to eliminate gender academic disparity at all levels of education by 2015 (Onsomu, *et al.*, 2005). Ethiopia has put different education sector development programmes in place to make education accessible, relevant, equitable and quality to all of its citizens and ultimately aiming to improve school enrollment, retention, and transition and completion rates of the nation. In spite of these programmes, the educational system is still suffering from gender-based academic achievement disparity at all levels. Teaching experiences of the researcher shows that female students often achieve less than males in all courses even though the remedial is given as affirmative action.

Educational scholars have accounted different evidences for the existence of gender differences in school performance. Some have associated gender performance disparities with students' level of participation and engagement in school learning (Zalizan *et al.*, 2013); others relate it to students' low motivation, absenteeism and drop out of school (Finn, 1989; Skinner *et al.*, 2008; Parker & Salmela-Aro, 2011). Still others attribute it to students' learning styles and skills as well as learning strategies that are in favor of some students than others (Lam, *et al.*, 2012). Most scholars agree that the school achievement disparity lies on the learner's experience, and recommend teachers to embrace various teaching methods and classroom settings to address each learner's learning. This implies that effective classroom interaction is among other things that create equal learning opportunity for males and females' to acquire and experience school behaviors, values and skills which are not explained in terms of their initial experiences and knowledge (Nnamani & Oyibe, 2016).

This experimental study, thus, was conducted to investigate combinations of interactive teaching approaches that improve students' engaged time (time on task), allocated time (total time available for learning) and academic learning time (time spend on working quality tasks of an appropriate difficulty), and thereby to alleviate gender-based academic achievement disparity.

### 1.2. Statement of the Problem

The College of Teacher Education (CTEs) enrolment figures of females have already outnumbered males. At college level, female to male ratio, on average, was 1.18 thanks to affirmative actions (MoE, 2015). However, the situation is grim in terms of academic achievement disparity. The question of gender equality in education means more than access to school for females and males (Amunga *et al.*, 2010). It combines the right to education (access and participation) with rights within education (gender sensitive environments, processes and outcomes) and rights through education, that is,

relevant education that connect outcomes to a wider experience of gender justice in society (*ibid*). Gender parity and equality is a key indicator of progress made towards global achievement of quality education for all (UNESCO, 2000).

Gender-based academic achievement disparity is even greater at tertiary than at primary and secondary education levels in Ethiopia (Tamirie, 2009). Study undertaken by Metasebia (2013) in three private university colleges in Addis Ababa identifies that female students' attrition is higher than that of males'. She attributes home chores pressure and sexual harassment as major attributing factors for gender-based academic achievement disparity. Congruently, the stress and the anxiety about insecure school climate cause females' mental attention, energy and efforts to be defused between protecting their psyches from attack and attending academic tasks. Other scholars have linked the higher disparity to gender irresponsive pedagogy used by the teachers to teach adult learners (Adunola, 2011). Teachers call on males more frequently, wait longer for them to respond to questions, give males students more eye contact, ask males higher-order thinking questions than females do. Grace and Gravestock (2009) also indicated that gender stereotyping was a core obstructing factor for engagement of females in learning. Male students are better in asking instructors for clarification inside and outside classroom than female students do. As a result, they have better GPA than that of females. Teshome (2007) links the disparity with costs of schooling, limited employment opportunities, socio-economic status, the economic value of girls and the level of parental education and their attitudes. Furthermore, Wakgari and Teklu (2012) observe in their findings that females are less achievers than males in CTEs. Gender stereotype and institutional satisfaction of students were chanted to be the major attributing factors for the disparity.

As to solutions, Metasebia (2013) suggests hiring more female instructors, opening gender office, giving parent awareness and orienting college life as strategies to minimize gender academic achievement disparity. The suggestions she made are all mainstreamed in the study CTEs except the first point. Despite the gender parity in access to education and recommended alternatives by scholars, the researcher's college teaching experience shows that female students have continued holding the lowest academic scores, highest course repetition and college dropout, least proportion in exit examination (COC) and leading group work activities including group discussion, assignment and project works and presentation. Thus, this study was carried out to investigate alternative interactive teaching methods and classroom settings to alleviate gender-based academic achievement gap focusing on the first-year regular students in Jimma and Nakamte CTEs.

### 1.3. Objectives of the Study

The study was specifically sought to:

1. Identify classroom arrangement types that could cause gender-based academic achievement parity.
2. Evaluate interactive teaching methods that enhance gender-based academic achievement parity.
3. Discuss the extent that interactive teaching and classroom setting alleviate gender-based academic achievement equity.
4. Appraise whether the achievement gap gets narrowed following the intervention or not.

### 1.4. Research Hypothesis

1.  $H_0$ : Classroom arrangement has no impact on gender-based academic achievement parity;
2.  $H_0$ : Interactive teaching has no effect to alleviate gender-based academic achievement differences;
3.  $H_0$ : Interactive teaching and classroom setting have no significant impact on gender-based academic achievement; and
4.  $H_0$ : the range of gender-based academic achievement gap hasn't narrowed after the intervention.

### 1.5. Significance of the Study

Sustaining engaged time of all students, particularly that of females' is vital as CTEs welcome more females than male trainees as would be primary school teachers. If these trainees are made competent in their teaching profession, they will contribute their part in maximizing retention, minimizing dropout, and maximizing completion of their respective school students. Besides, gender academic achievement equity enhances the effort to achieve accessible, relevant and quality education for all nations. Thus, this study helps learners to improve their learning performances, aids teacher trainers to employ alternative teaching approaches and assists college administrators to take corrective measures to alleviate gender-based academic achievements.

## 2. Review of Related Literature

There are several contemporary theories that have moved away the explanations for educational achievement differences between boys and girls from primordial classic biological to social insights. Psycho-social and structuration theories are among the others which could put this study into their nutshell. The biological theory explanations for the educational achievements of girls and boys lay on brain size and development which glimpse internal factors and sluggish traditional teaching methods. Contrary to these, the social theories explain the achievement differences in terms of external factors including primary socialization patterns and differential experiences offered to males and

females by the family and the organization or teachers-students-students interactions in school. The first theory attributes the variance of achievement to sex of children while the later denounces engendered classroom learning strategies and school stratification. Sex refers to the biological division into male and female; gender to the parallel and socially unequal division into femininity and masculinity (Oakley, 1981). Gender is a strong predictor of human conduct and many differences have been documented on attitude and behavior that affect academic performance between male and female (Block, 2006).

According to the structuration theory, the social world is composed of social systems (family, peer groups, class and patriarchy) and structures including the rules, resources, and social relationships that actors produce and reproduce through social interaction across time and space. Everyone still continues to live a local life, and the constraints of the body ensure that all individuals, at every moment, are contextually situated in time and space (Giddens, 1984). For Giddens, structure is more specific and detailed than social system to act upon and alleviate gender academic achievement disparity. Rules and resources are the two primary features of structures which govern position of males and females in educational institutions, market exchange, class structures, political organizations and processes. Interactive teaching approach requires teachers to understand and analyze locally how these rules are enacted and resources are allocated among members of society to implement gender responsive pedagogy in classroom teaching.

Giddens has broadly identified two types of rules and resources— Procedural rules and Moral rules – that implicitly accommodate rules and resources teachers communicate in classroom teaching-learning process. Procedural rules govern how the social practice, norms, mores, customs and language usage is performed. Moral rules refer to appropriate ways of carrying out or enactment of social action and interaction, what is permissible and what is not. Classroom communication between teachers and students during instruction matters energy of a student’s engagement and gender academic achievement parity. The second manifestation of structure is resources. Material resources are means of production, income and capital goods while authority resources are related with power and its exercise. As imbalanced allocation of resources among members of society produces social inequalities, teaching methods, materials, rewards and role division which entertain male student is inevitably results in gender academic achievement difference.

According to the psycho-social theory, educational achievements, participations and wastages of boys and girls are determined by socio-cultural and historic attitudes, economic and political decisions, religion and organization and structure of schools (Swainson, 1995). Okoro (2008) observed that males and females show great differences in their interest and career choice which might be attributed to the psychological differences and cultural influences. Similarly, Lie and Syoberg (2004) noticed that invisible rules within the society have provided what is feminine and what is masculine.

Similarly, scholars like Kutnick (1997) identifies four profound issues that encapsulate gender academic achievement disparity in Trinidad and Barbados based on naturalistic classroom observation and ethnographic techniques of reflection. The first is teacher behaviors which are elucidated by general classroom interaction with students and quality and preferences expressed in working with the learners. Teachers are

required to devise clear and well-ordered rules, expectations and self-controlled classes where students would act as autonomous and self-motivated learners. The second is student behavior that is interactions among students' and their reflections on their learning classrooms. Males and females did not interact together unless directed to by their teacher. The third is classroom management strategies, practices undertaken by teachers for control of learners through seating patterns, responses to misbehavior. Classrooms should run in a student-centered, with the teacher at facilitating position. The last is teaching and learning strategies. It is practices that are employed by teachers to promote, support and develop students' learning and observations carried out to make communication between teacher and students effective. Two-way communication between teacher and students and students and students are effective in promoting students' engagement, understanding and participation.

### **3. Methods and Material**

#### **3.1. Experimental Research Design**

Two-way, which is two-by-three, factorial experimental research design was employed for this study. Factorial design was preferred to other designs for its greatest flexibility to examine treatment variations, effectiveness to explore interaction effects and efficiency to treat wide range of variables relationship simultaneously. A large number of factors affect the teaching-learning process. Thus, the design contains a complete trial/replication formed by each level of one independent variable with each level of another factor for investigation.

#### **3.2. Experimental Research Procedure**

The researcher has requested and obtained permission from the respective college administrators for the participation of their students and teachers in the study. Teacher trainers, who were assigned to teach the selected classes of the respective colleges and assumed research assistants, were given one-day intensive training on the devised interactive teaching methods (treatment variables) package before they embark on offering the second semester courses. After training, the implementation of treatment variables started at respective classrooms and lasted for the span of sixteen weeks which is the normal schedule of the colleges to complete the courses students registered for. The researcher toured the participant colleges to monitor the progress of the study.

Treatment variables that were devised in response to bequeath gender-based achievement gap was arbitrarily assigned among the selected classes. Accordingly, the 1<sup>st</sup> class was designated for small group seating arrangement-SGS and cooperative learning-CL; the 2<sup>nd</sup> class was assumed for SGS and gender responsive pedagogy-GRP; the 3<sup>rd</sup> class was chosen for SGS and teachers' immediacy behaviors-TIB; the 4<sup>th</sup> class was selected for WGS and CL; the 5<sup>th</sup> class was delegated for WGS and GRP and the last class for WGS and TIB. Effects of the observed variables were identified using continuous classroom assessments.

### 3.3. Sample Size and Sampling Techniques

There were 12 CTEs in Oromia National Regional State. They were homogeneous in terms of medium of instruction, teaching materials (centrally prepared modules), student-teacher and student-class ratios, teachers' educational competencies, students' backgrounds, etc. Hence, Jimma and Nakamte CTEs were selected randomly to get sufficient classes. Yamane (1967) formula,  $n = N/1 + Ne^2$  (n=sample number, N=target population and e=error margin,  $\alpha=.05$ ), was used to determine the sample size. About six classes (52 students each) with a sum total of 312 students (156 males and 156 females) were recruited proportionally from 1408 first year regular students assigned to social and natural streams of the two colleges.

In this region, students are randomly assigned to their respective CTEs after passing the standardized regional CTEs entrance examination. The study has used the advantage of this randomized students' arrangement in these colleges to ensure the maximum external validity though factorial experiment research design is possible with or without random assignment of the participants. Randomization assures all classes equal chance of being represented prior to the introduction of independent/treatment variables. Thus, it is logically sound to use the already randomized classes as a target population from which representative sample is drawn for the study. For this study, first year regular students were targeted intentionally because they have profound gender-based academic achievement disparity for several reasons when compared to second- and third-year regular students. College teaching-learning environment is different from the general education they have already known, and this needs students much time to deal with the new learning environment. Moreover, all teacher trainers who were offering courses for the selected classes during the study period have become automatically the participants and assistants of the study.

### 3.4. Data Sources

**Primary data sources** – students in selected classes, course offering teachers and top college administrators were the primary data sources.

**Secondary data sources** – grade 8 regional examination, grade 10 national examination and first semester college GPA results of the recruited students were obtained from their respective registrars, converted into the scale of one to ten and used to analyze the trend of gender-based academic achievement disparities. Besides, first semester college assessment results were utilized as pretest and compared with the intervention results (post-test). Pre-test results were assumed valid, because colleges authenticated the contents, faces and codes of the assessments before administration. Pre-college (8<sup>th</sup> and 10<sup>th</sup> grades) and college academic achievements of the respondents were also used to see the trend of gender-based achievement gap over the ladder of education. Here, internal validity threats such as maturity, history, testing, instrumentation, selection, mortality, etc. are assumed equal for the two groups, and the difference between the pre-test and post-test explains the effect of intervention alone.

### 3.5. Tools of Data Collection

Group and individual work projects and assignments as well as classroom quiz masters and final examination were used as data collection tools to find out the extent that treatment variables irrefutably influence the gender-based academic achievement parity. The contents of constructed tools were validated against the taught courses by the respective course offering department teachers before use. Its reliability was also checked with non-participant students, and found to be 0.73 by employing the Alpha Cronbach method. Average learning scores were computed separately for male and female students. Furthermore, semi-structured interview was carried out to obtain opinions of the participants on the used interactive teaching approaches in enhancing their teaching-learning process.

### 3.6. Data Analyzing Techniques

Tables and graphs were used to demonstrate most of the results. Pretest and posttest average achievements of females and males were presented separately using tables for comparisons. Moreover, graphs were employed to show the existence of interaction effects between treatment factors, and the trend of gender-based academic achievement gap from the primary to college education. ANOVA of between-subjects' effects were applied to see variations of the simple main effects of individual treatment on academic scores and interaction effects between factors. Finally, Scheffe's post hoc tests were used to identify combinations of approaches that are better acknowledged to minimize the gender-based academic achievement gap.

## 4. Results

Post-test and pre-test results of the selected groups were organized, presented and discussed as follow. Table 3.1 indicates that the average post-test results of male students were getting improved overall except for the two groups. One group which was taught by CL-WCS has scored the same post-test means result as pre-test meanwhile the other group that was taught by GRP-WCS has scored post-test mean result lower than the pre-test means.

Table 3.1: Comparison of Pre-test and Post-test Academic Results of Male Students

		<i>Classroom Setting Factor</i>					
		Levels	WCS	SGS		WCS	SGS
<i>Interactive Teaching Factor</i>	CL	60	65		60	75	
	GRP	77	77		75	80	
	TIB	55	65		80	90	
		<i>Pre-test Results</i>				<i>Post-test Results</i>	

NB: WGS = Whole Group Setting, SGS = Small Group Setting, CL= Cooperative Learning, GRP = Gender Responsive Pedagogy and TIB = Teachers' Immediacy Behaviors



Similarly, the average post-test results of female students were substantially improved. All groups of the females taught under different treatments have scored post-test mean results better than their pretest means (See Table 3.2). The result proven that in the absence of damaging stereotypes consequences, female students can build real self-esteem and confidence which inspire them to engage in learning.

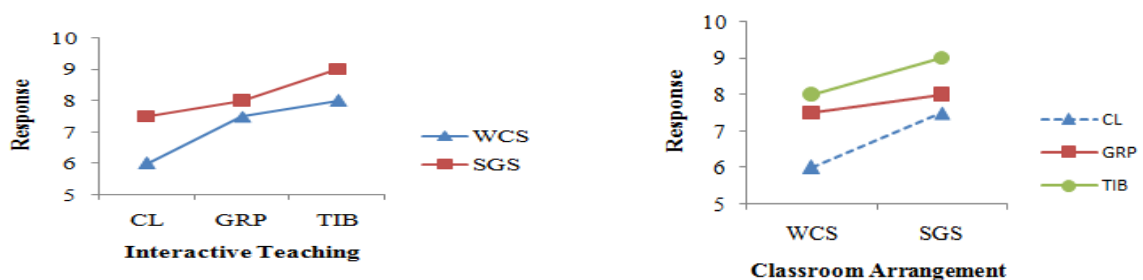
Table 3.2: Comparison of Pre-test and Post-test Academic Results of Female Students

		<i>Classroom Setting Factor</i>					
		Levels	WGS	SGS		WGS	SGS
<i>Interactive Teaching Factor</i>	CL	45	40		60	75	
	GRP	50	55		55	80	
	TIB	50	45		75	85	
	<i>Pre-test Results</i>			<i>Post-test Results</i>			

**a. Existence of Interaction Effect (Graphical aid for analysis)**

Examining an interaction plot of the cell means is a useful first step in considering an interaction effect of independent variables on the dependent variable (cause-effect relationship). Specifically, an interaction effect exists when the effect of one independent variable on the dependent variable depends on the value of other independent variable included in the factorial research design (Jaccard, 2003).

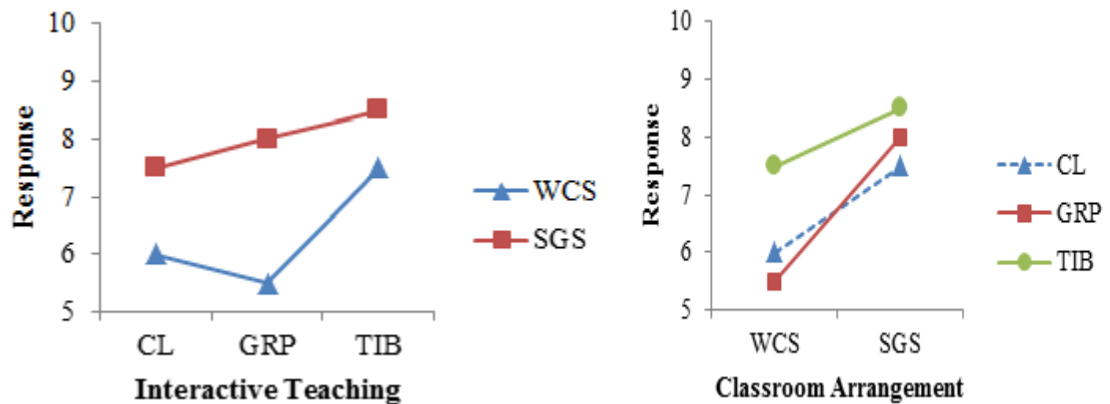
Line graph 3.1 reveals that the lines, which depict interaction effects of classroom arrangement on interactive teaching and vice versa, do not appear to be parallel in the case of male students. The lines were actually converging implying that the effects of levels of interactive teaching factor were not the same for each level of the classroom setting factor and vice versa. The two-way interaction effects of interactive teaching and classroom arrangement show that small group seating has stronger positive effect on students' learning achievement and would address more learning styles than the whole group seating does. Specifically, this small group seating arrangement would be stronger for teachers' immediacy behaviors and gender responsive pedagogy than cooperative learning methods. When a simple main effect for interactive teaching factor was introduced to each level of classroom setting factor, teachers' immediacy behaviors and gender responsive pedagogy would be stronger for small group setting and both would be preferred to alleviate gender academic achievement disparity.



Line graph 3.1: Interaction effects of classroom setting and interactive teaching for male students

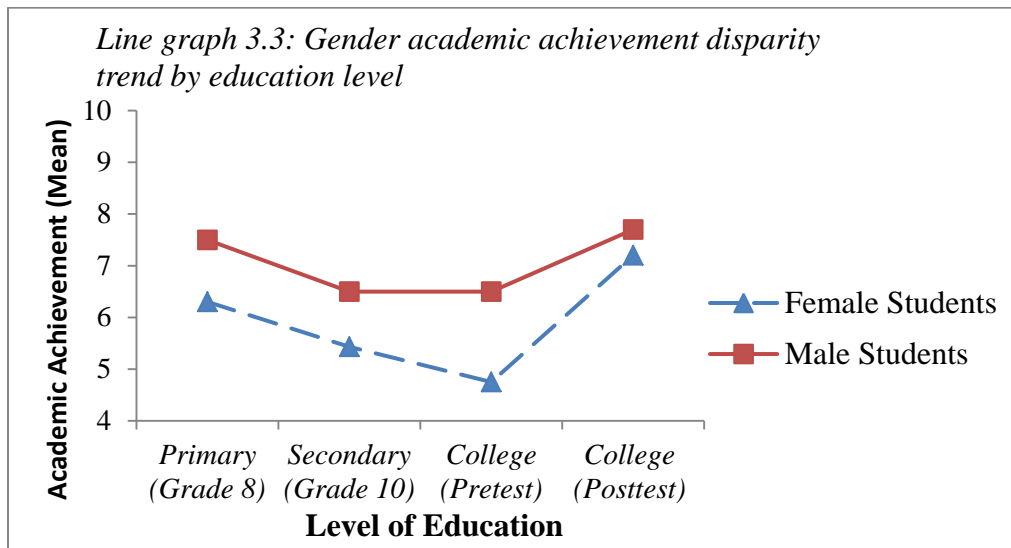
Likewise, the lines representing interaction effects of classroom arrangement on interactive teaching and vice versa were observed to be congregating or intersecting in the case of female students (Line graph 3.2). Levels of classroom setting were also considered at each level of interactive teaching factor for female students, and the interaction effects show that small group seating has stronger effect on students' learning achievement and would address more learning styles than the whole group seating. This small group setting would be also stronger for gender responsive pedagogy and teachers' immediacy behaviors than cooperative learning methods. While levels of interactive teaching factor were brought together with classroom setting factor, teachers' immediacy behaviors and gender responsive pedagogy had stronger interaction effects for small group setting than the whole group setting and they were effective or gender academic achievement parity.

Existence of positive relationship between classroom setting and interactive teaching approaches justifies that improvement in students' learning performances is highly attributed to treatment variables.



*Ling graph 3.2:* Interaction effects of classroom setting and interactive teaching for female students

It was appreciated that both interactive teaching and classroom seating have induced significant effect on the improvement of male and female groups' learning performances. Post-test results of female and male students were also compared to determine the group that has supported more to alleviate academic achievement disparity in this most natural and equity thrived learning environment. Line graph 3.3 compares the pretest and posttest results of the two groups. The line designated by female students has indicated abrupt, radical and prompt changes over the line denoted by male students. It is possible to deduce that females were more supported than males under these circumstances, and they unleashed higher talents and efforts to alleviate the gender academic achievement gap. This line also demonstrates the trend of gender academic achievement disparity. The trend of disparity was getting narrowed following the intervention. The intervention ensures equity to compensate for historical and social disadvantages that prevent females and males from operating on equally leveled playing ground. Equity is equality of opportunity among people where a person's success should be determined primarily by his/her talents and efforts rather than by pre-determined circumstances such as race, gender, social family background (World Bank, 2005).



Source: Calculated based on respondents' College score and grades 8 and 10 exam results

#### b. ANOVA Tests of interaction effects significance

The two-way analysis of variance was applied to determine whether either of the two independent variables: interactive teaching and classroom arrangement or their interaction (teaching \* classroom) have statistically significant effect on the dependent variable (academic achievement) for the groups (Jaccard, 2003). The result of the **tests of between-subjects' effects** shows that there was a significant two-way interaction of interactive teaching \* classroom arrangement ( $F=18.914, p = .000$  for female students;  $F=8.053, p=.000$  for male students). This would suggest that the effect of interactive teaching depended on the classroom setting and vice versa. The pattern of this interaction was that, small group seating made both female and male students more effective than whole group seating, and this effect was stronger for gender responsive pedagogy and teachers' immediacy behaviors groups than for cooperative learning groups. This two-way pattern was also descriptive for each level of interactive teaching. The simple main effects of both interactive teaching and classroom arrangement are also significant for the two groups (*for females:  $F=67.551, p=.000$ ;  $F=270.203, p=.000$  and for males:  $F=99.315, p=.000$ ;  $F=96.630, p=.000$ ). The larger sum of squares also tested that academic achievement of female students was highly dependent upon the classroom setting and interactive \* classroom interaction while that of male students was highly dependent upon interactive teaching.*

Table 3.3: ANOVA Tests of Between-Subjects Effects  
 Dependent Variable: Academic Scores

Gender	Source of variations	Type III Sum of Squares	Degree of freedom	Mean Square	F	Sig.
Female	Corrected Model	17766.667 <sup>a</sup>	5	3553.333	88.627	.000
	Intercept	801233.333	1	801233.333	19984.204	.000
	interactive	5416.667	2	2708.333	67.551	.000
	classroom	10833.333	1	10833.333	270.203	.000
	interactive * classroom	1516.667	2	758.333	18.914	.000
	Error	6014.000	150	40.093		
	Total	825014.000	156			
	Corrected Total	23780.667	155			
Male	Corrected Model	12566.667 <sup>b</sup>	5	2513.333	62.273	.000
	Intercept	916933.333	1	916933.333	22718.864	.000
	interactive	8016.667	2	4008.333	99.315	.000
	classroom	3900.000	1	3900.000	96.630	.000
	interactive * classroom	650.000	2	325.000	8.053	.000
	Error	6054.000	150	40.360		
	Total	935554.000	156			
	Corrected Total	18620.667	155			

<sup>a</sup>R Squared = .747 (Adjusted R Squared = .739)

<sup>b</sup>R Squared = .675 (Adjusted R Squared = .664)

### c. Multiple Comparisons

ANOVA tests merely consider that all the treated groups have different mean responses. Hence, multiple pairwise comparisons are decisive approach to find out significant differences in cell means, and identify factors that produce most desirable results on gender academic achievement parity. This involves determining the mean difference between interactive teaching levels at each classroom setting level and between classroom seating levels for each interactive teaching level. Table 3.4 and Table 3.5 display the results of pairwise comparisons that were obtained using the Scheffe's post hoc tests. Accordingly, there are 30 pairwise comparisons/combinations; of which 10 pairwise are statistically significant (Tables 3.4 and 3.5). The pairwise mean differences of CL-WCS and GRP-WCS were statistically significant and lower than the average means of the interactive teaching and classroom seating factors for female groups at  $\alpha = .05$ . There were no significant differences when the mean scores of CL-SGS, GRP-SGS, TIB-WCS and TIB-SGS were compared with their respective pairwise for female groups. Here, the upper bound and lower bound intervals have similar either positive or negative signs and contain zeros at 0.05 level of significance. This indicates that WCS was a challenging aspect for females to improve their learning and performances. This is because it entertains a competitive learning environment which allows males to dominate the teaching-learning process. These results suggest that CL-SGS, GRP-SGS, TIB-WCS and TIB-SGS approaches are appropriate methods to teach female groups to alleviate gender-based academic achievement disparity when compared to CL-WCS and GRP-WCS. For this

reason, teachers have to minimize the use of whole class seating arrangement that debilitates the cooperative learning and gender responsive pedagogy environment.

Similarly, the pairwise means differences of CL-WCS and TIB-SGS were statistically significant for male group sat  $\alpha = .05$ . No significant differences were observed for the remaining groups when their mean scores were compared with their respective pairwise as their intervals also contain zeros. This also suggests that CL-SGS, GRP-SGS, GRP-WCS and TIB-WCS approaches are appropriate methods for male groups' learning. Besides, Scheffe's post hoc tests show that TIB-SGS is suitable teaching approach to combat gender-based academic achievement disparity. Students whose teachers had applied teachers' immediacy behaviors in small group seating received higher scores than students whose teachers had applied teachers' immediacy behaviors in whole group seating. Like female groups, the whole class seating arrangement that totally depends on cooperative learning should be minimized for male groups.

Table 3.4: Multiple Comparisons (gender=female)  
Post Hoc Tests: Scheffe

Dependent Variable: Academic Scores

Gender	(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
			Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound
Female	CL-WCS	CL-SGS	-15.0(*)	1.75	.000	-20.92	-9.07
		GRP-WCS	5.0	1.75	.158	-.92	10.92
		GRP-SGS	-20.0(*)	1.75	.000	-25.92	-14.07
		TIB-WCS	-15.0(*)	1.75	.000	-20.92	-9.07
		TIB-SGS	-25.0(*)	1.75	.000	-30.92	-19.07
	CL-SGS	CL-WCS	15.0(*)	1.75	.000	9.07	20.92
		GRP-WCS	20.0(*)	1.75	.000	14.07	25.92
		GRP-SGS	-5.0	1.75	.158	-10.92	.92
		TIB-WCS	0.0	1.75	1.000	-5.92	5.92
		TIB-SGS	-10.0(*)	1.75	.000	-15.92	-4.07
	GRP-WCS	CL-WCS	-5.0	1.75	.158	-10.92	.92
		CL-SGS	-20.0(*)	1.75	.000	-25.92	-14.07
		GRP-SGS	-25.0(*)	1.75	.000	-30.92	-19.07
		TIB-WCS	-20.0(*)	1.75	.000	-25.92	-14.07
		TIB-SGS	-30.0(*)	1.75	.000	-35.92	-24.07
	GRP-SGS	CL-WCS	20.0(*)	1.75	.000	14.07	25.92
		CL-SGS	5.0	1.75	.158	-.92	10.92
		GRP-WCS	25.0(*)	1.75	.000	19.07	30.92
		TIB-WCS	5.0	1.75	.158	-.92	10.92
		TIB-SGS	-5.0	1.75	.158	-10.92	.92
	TIB-WCS	CL-WCS	15.0(*)	1.75	.000	9.07	20.92
		CL-SGS	0.0	1.75	1.000	-5.92	5.92
		GRP-WCS	20.0(*)	1.75	.000	14.07	25.92
		GRP-SGS	-5.0	1.75	.158	-10.92	.92
		TIB-SGS	-10.0(*)	1.75	.000	-15.92	-4.07
	TIB-SGS	CL-WCS	25.0(*)	1.75	.000	19.07	30.92
		CL-SGS	10.0(*)	1.75	.000	4.07	15.92
		GRP-WCS	30.0(*)	1.75	.000	24.07	35.92
		GRP-SGS	5.0	1.75	.158	-.92	10.92
		TIB-WCS	10.0(*)	1.75	.000	4.07	15.92

\* The mean difference is significant at the .05 level.

Table 3.5: Multiple Comparisons (gender=male)

<i>Post Hoc Tests: Scheffe</i>			<i>Dependent Variable: Academic Scores</i>				
Gender	(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
			Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound
Male	CL-WCS	CL-SGS	-15.0(*)	1.76	.000	-20.94	-9.05
		GRP-WCS	-15.0(*)	1.76	.000	-20.94	-9.05
		GRP-SGS	-20.0(*)	1.76	.000	-25.94	-14.05
		TIB-WCS	-20.0(*)	1.76	.000	-25.94	-14.05
		TIB-SGS	-30.0(*)	1.76	.000	-35.94	-24.05
	CL-SGS	CL-WCS	15.0(*)	1.76	.000	9.05	20.94
		GRP-WCS	0.0	1.76	1.000	-5.94	5.94
		GRP-SGS	-5.0	1.76	.161	-10.94	.94
		TIB-WCS	-5.0	1.76	.161	-10.94	.94
		TIB-SGS	-15.0(*)	1.76	.000	-20.94	-9.05
	GRP-WCS	CL-WCS	15.0(*)	1.76	.000	9.05	20.94
		CL-SGS	0.0	1.76	1.000	-5.94	5.94
		GRP-SGS	-5.0	1.76	.161	-10.94	.94
		TIB-WCS	-5.0	1.76	.161	-10.94	.94
		TIB-SGS	-15.0(*)	1.76	.000	-20.94	-9.05
	GRP-SGS	CL-WCS	20.0(*)	1.76	.000	14.05	25.94
		CL-SGS	5.0	1.76	.161	-.94	10.94
		GRP-WCS	5.0	1.76	.161	-.94	10.94
		TIB-WCS	0.0	1.76	1.000	-5.94	5.94
		TIB-SGS	-10.0(*)	1.76	.000	-15.94	-4.05
	TIB-WCS	CL-WCS	20.0(*)	1.76	.000	14.05	25.94
		CL-SGS	5.0	1.76	.161	-.94	10.94
		GRP-WCS	5.0	1.76	.161	-.94	10.94
		GRP-SGS	0.0	1.76	1.000	-5.94	5.94
		TIB-SGS	-10.0(*)	1.76	.000	-15.94	-4.05
	TIB-SGS	CL-WCS	30.0(*)	1.76	.000	24.05	35.94
		CL-SGS	15.0(*)	1.76	.000	9.05	20.94
GRP-WCS		15.0(*)	1.76	.000	9.05	20.94	
GRP-SGS		10.0(*)	1.76	.000	4.05	15.94	
TIB-WCS		10.0(*)	1.76	.000	4.05	15.94	

\* The mean difference is significant at the .05 level.

## 5. Discussions

Finding of this study shows that most students could achieve better academic scores after the intervention though females performed better than their male counterparts. The finding corroborates with similar studies which were conducted in Africa, Asia and North America. Findings of Dania (2014) on the gender achievement gap in Social Studies in Nigeria, Eze et al., (2016) on technical colleges in Nigeria, Ann et'al., (2015) on pre-service school counselors and teachers in USA and Amunga et'al., (2010) on gender achievement gap in Science and Mathematics in Kenya assert that

gender academic achievement disparity is certain and concluded that interactive teaching methods have the potential to improve students' academic performance and retention in any subject irrespective of gender. Similarly, the results were verified by preceding related studies carried out in Ethiopia (Teshome, 2007; Wakgari & Teklu, 2012; Metasebia, 2013; Amogne, 2014). Furthermore, this finding was found compatible with case studies conducted in some Asian, Latin American, European and Australian countries. Girls outperformed boys in all subjects as a group in Malaysia, Philippines, Canada, Caribbean, United Kingdom and Thailand (Goolamally & Ahmad, 2011; Torres, 2011).

Semi-structured interview results also show that these learning strategies have unleashed the untapped learning potentials of the slow learners, especially females to feel competent, autonomous and involving. Student engagement in learning is also optimized when the social context fulfills learner's basic psychological needs which include the needs to be competent, autonomous and related to other people (Wentzel, 2009). The need for competence reflects an individual's need to feel that he/she has adequate capability to carry out his/her own learning. It is developed when teachers clearly communicate expectations, frequently provide feedbacks and adjust teaching strategies to student's learning style. Teachers should acquire facilitating behaviors to accomplish the need for competence (Froyd, 2007; James, 2015). The need for autonomy reflects an individual's need to experience windows of opportunities to connect/fit learning with her/his real live activities, interests and preferences. Teachers should acquire immediacy behaviors to accomplish the need for autonomy support instead of forcing students to be cooperative and quiet (Roth, et.al, 2007; Hein, et'al., 2012, Nzoka & Orodho, 2014). The need for relatedness indicates the desire to feel involved or have a sense of belongingness to others including peers and teachers and is fundamental for their learning. Teachers should acquire praising/involvement behavior to accomplish the need for relatedness. Informants were experiencing their teachers as facilitators, egalitarians and praises; all made them engage, feel happier and more enthusiastic in learning. Engaged learners would stay in school longer, learn more, feel better about themselves and continue their lifelong education (Skinner & Belmont, 1993). Moreover, teachers produce students who have high behavioral, emotional and cognitive engagement (Fredricks, 2014).

## 6. Conclusions

The findings of this study have identified the different learning performances which were observed among competition (WCS) and cooperation (SGS) based learning groups. The goal of learning is to facilitate learners to cultivate knowledge, skills and attitudes. Teachers are expected to enhance cooperative learning which ultimately unleashes students' learning potentials and prepares them to join fair competition. Gender academic performance parity is also a key element in ensuring equal labour market engagement of universal human rights and balancing social, economic and political benefits of the whole nations.

## 7. Recommendations

Based on the findings of the study, the following recommendations were forwarded.

- Students would learn lessons at equal level when teachers could engage them in learning equally. Thus, teachers are expected to maintain balance and to deepen their skills of gender responsive pedagogy, cooperative learning, teachers' immediacy behaviors and classroom seating and management to the highest quality to alleviate gender academic achievement disparity.
- CTEs should promote gender responsive pedagogies; engage teaching methodologies and participatory classroom arrangement as strategies to alleviate gender academic achievement alongside the endorsement of school-based clubs supporting gender equality; provide remedial courses, and incorporate counseling programs to support learning of females.
- The learner-centered methods have potential to support improved learning outcomes for all students, but particularly females and slow learners who are not excelling under the converging teaching-learning system. Teachers should devise active learning methods that enhance students' participation and learning performance.
- A student-centered learning environment (small group seating) is more efficient than a traditional teacher-centered environment (whole class setting) to produce better learning outcomes for all learners. Therefore, teachers should produce an enhancing ambiance to keep students engaged on-task and motivated throughout the learning process.

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