English as a Foreign Language (EFL) learning assessment in single-sex and co-educational classrooms

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ABSTRACT

This study investigates the effects of Single-Sex and Co-educational classrooms on English learning outcomes. This study is a causal-comparative study in ex post facto design. The sample is three classes consisting of 73 students (boy and girl-single-sex classes and a co-educational class) from a private secondary school in Central Java, Indonesia. An integrated English test was used, equating the 2013 curriculum and CEFR for English. It tested four skills in English consisting of Listening, Speaking, Reading, and Writing. Expert judgments have already checked the instrument through face validity. Item internal consistency from all skills was good, and the reliability was too, in a good category. This study indicates that organizing a Single-sex classroom in the English learning process has a positive and significant effect on English achievement. Being in a Single-Sex classroom benefitted the students in their outcomes in learning English. This study also implies that teachers, especially English teachers, must understand their students' learning strategies to implement the appropriate learning strategies. It is because male and female students learn something in different ways.

INTRODUCTION

A substantial scholarship provides compelling evidence that religious values and tenets are interwoven with education practices (Eluu, 2016). One example expounding this avowal is the phenomenon of separation between female and male students in learning (gender segregation). Gender segregation stands for two kinds of classroom organization: a Single-Sex classroom (henceforth SS) and a Co-educational classroom (henceforth CE). According to the Policy and Program of American Education Program (2005), "SS education generally refers to education at the elementary, secondary or postsecondary level in which male or female students attend school or classroom exclusively with members of their own set" (U.S. Department of Education, 2005, p. 1) and "Coeducation, generally, refers to education at the elementary, secondary or post-secondary level in which male and female students attend school or classroom altogether with members of their group" (U.S. Department of Education, 2005, p. 1). Extracting from the definition of SS education and coeducation, a SS classroom consists of only female or male students in the learning process, whereas a CE classroom consists of both male and female students in the learning process.

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Critically, gender segregation at school is believed to be one of the prominent causes of demolishing inequality (Smyth & Steinmetz, 2008). Implementing classroom organization based on gender segregation is assumed to decrease inequality between men and women. Ergo educational institution works as the engine in gender inequality (Barone, 2011). Besides, gender segregation stresses the innate differences between male and female students (Ecklund et al., 2012). Created differently, men and women should be treated in distinct ways too to meet their necessities. Male and female students have different ways of seeing, hearing, thinking, and learning. Significantly, it affects the learning achievements of STEM and Physical education (Best et al., 2010; Blake, 2012; Bradley, 2009; Douglas, 2011; Laster, 2004; Pahlke et al., 2014; Parker & Rennie, 2002; Pendleton, 2015; Whitlock, 2006; Younger & Warrington, 2002).

Although there is significant evidence demonstrating the importance and impacts of gender segregation in education, limited research protocols have still been taking shape this gender segregation role in language learning, particularly in English language learning and achievement. A study by Mathers (2008) merely studies about the role of SS and CE classrooms on boy students' attitude and self-perception of competence in French, and shows that self-perception of competence of the students in the SS classroom was healthier for various reasons. The boy students in the SS classroom were more willing to work hard, not afraid of making mistakes and errors, and better risk-takers. According to Mathers (2008), those characteristics were crucial ingredients for developing French-speaking skills. Those findings also suggest that the SS classroom environment is superior for boys in French communicative activities.

Likewise, a study by Aslan (2009) on the influence of gender and language learning strategies in learning English shows that the language learning strategies used gave advantageous effects in improving English achievement. Female students were better than male students in terms of achievement tests because female students involved more language learning strategies in learning English. Furthermore, based on the statistical results, there was a significant connection between gender, language learning strategies, and achievement in English. Thus, undoubtedly, based on Aslan (2009) and Mathers (2008) studies, there is a lack of knowledge and information on how gender segregation could impact learners' English learning process and achievement. Thus, there is a need to study gender segregation in English language learning, especially in Indonesia.

Gender segregation issue in Indonesia has been applied since formal education in the country was established. Education in Indonesia is mainly believed to be influenced by religious values by many believers. Islamic values predominantly underlie the foundation of education in Indonesia. It is also obliged to deliver religious values at every level of education. These phenomena are quite different from education wisdom in some countries that rarely put religion as part of the mandatory subject at school. Based on this condition, the education system in Indonesia relates to Islamic teaching. Hence, several schools are ruled under Islamic values. One of the values is to differentiate between males and females. In Islam, the males and the females are forbidden to be in one area without any legal law, like marriage. For example, some schools under Islamic boarding schools/*Pesantren* policy tend to put their students into classes based on their sex. Islamic schools rule the wisdom to implement gender segregation, and Christians, notably Catholics and Jewish schools, are also noted to maintain the classification or divide the class member based on their genders. It becomes an interesting phenomenon for the researcher to investigate.

Despite being implemented, gender segregation in education still finds many problems in the field. The students' problems are as follows: the first thing that includes problems is students' motivation. Students admitted that being in the CE classroom made them not accessible in involving the learning process. They were more motivated and confident in the SS classrooms. The reason was that they were more comfortable and more accessible in the English learning process. It is in line with the theory of adolescent development. It stated that senior secondary school students are in the age of adolescence, and based on Vygotsky's theory on adolescent development, they are in the transitional period, from childhood to adulthood. In this period, adolescence experiences changes in their biological, psychological, and social aspects (Santrock, 2011).

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In addition, According to Jean Piaget (Santrock, 2011), the cognitive development of adolescence is on the stage of formal operation that is included in the last stage of the four cognitive stages. To understand more about the formal operation stage from adolescent cognitive development, Vygotsky (Santrock, 2011, p. 101) explains the proximal development zone. It is a zone experienced by every individual where they cannot solve complex tasks only by themselves. Those tasks only can be fixed by the support or supervision from the adult or peer friends who are trained. Based on this theory, Vygotsky states that the school is a cultural agent that can determine adolescent thinking development. It emphasizes that the classroom atmosphere is very urgent to be paid attention to in order to create a supportive school environment that can stimulate the reach of optimum thinking development of the adolescence. Uncertainty, the classroom environment does not support the learning process; the students are simply unmotivated to involve.

Furthermore, senior secondary school students are around sixteen and seventeen years old. They are called teenagers. Teenagers experiencing puberty have more interest to attract more attention from one another (Forbes & Dahl, 2010). Therefore, a CE classroom can have two kinds of effects. It can be a positive effect if the students are encouraged to learn English activities by undergoing that phase. Though they are meant to attract their target attention, they will be more motivated during the classroom activities. However, it also can harm shy students. They even will say nothing in the class because they are afraid of being paid attention.

Conversely, SS classrooms are considered to give the same experiences to the students. On one side, students can be focused and free in taking into the English learning process. On the other side, they can be bored and unmotivated in attending the class because they are of the same sex. Based on this period the students undergo in that age, the students gaining the positive effects will be so much helped because it can encourage positive affective filters that can stimulate the subject's acquisition. On the other hand, if they get the adverse effects, they will be less motivated because the reluctance will increase their anxiety about teaching and learning English.

Another problem merged in implementing SS and CE classrooms is students' involvement in the English learning process. This condition was related to the motivation of students. When the students are motivated to learn something, they will be persistent, not anxious, and good risk-takers.

In line with the result of the preliminary studies through survey and observation, one of the SLA theories declares that many factors influence SLA speed, namely internal and external factors. Motivation includes an internal factor, and environment includes an external factor. Those factors can accelerate or impede the SLA process.

Students who attended SS classrooms having lower anxiety to be involved in the English learning process will be active and perform well in every English learning activity. On the other hand, those in the CE classroom eventually could not execute the English learning activities and SS students. That is because of the higher anxiety produced by the classroom environment. This problem was in line with the finding of study by Mathers (2008). Her study revealed that male students felt more willing to perform freely in the SS classroom than in the CE classroom. This finding indicates that the SS classroom contributes a positive environment in the language learning process. Contrariwise, Younger and Warrington (2002) suggested that both SS and CE classrooms gave the same learning process and achievement effects.

The third problem in implementing SS and CE classrooms is the English learning achievement. The English learning achievement reached from the learning English process is dealt with the involvement of the students during the process of learning English. Being comfortable and confident in learning English stimulates their comprehension of the material they receive in the classroom. These factors mushroom students' English achievement. It also interests the researchers to research further the effects (both positive and negative) of SS and CE classrooms. The research questions proposed are there any significant differences in students' mean scores on integrated English tests in SS and CE classrooms? Moreover, what kind of classes serve the students better learning environment affecting their learning outcome?.

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METHOD

To best investigate the research question, aspects of quantitative study were conducted. Therefore, a causal-comparative study was utilized to allow evidence from the students' English proficiency test in three settings: boy-single-sex girl-single-sex classes, and co-educational classes.

Like experimental research, causal-comparative research involves comparing groups to see whether some independent variable has caused a change in a dependent variable. Causal – comparative research sets up studies to control possible extraneous variables (Lodico et al., 2010). Single-sex and co-educational classrooms have already been experienced, so they cannot be manipulated experimentally. The classroom setting, single-sex or co-educational classroom, as the independent variable will be seen as the factor influencing senior high school students' English achievement.

The study was conducted in an Islamic senior high school in central Java, Indonesia, which has already maintained this classroom setting for years. The participants in causal-comparative research already belong to groups based on their past experiences, and the researcher selects participants from these preexisting groups. An essential consideration in designing a causal-comparative study is whether the two groups are similar (comparable) except for the independent variable they are being compared to (Lodico et al., 2010).

This study collected data from a causal-comparative study measuring the mean difference between the three classes involved in this study. The three classes were the SF class, the SM class, and the CE class. Twenty-four students were in the SF class, 25 students were in the SM class, and 24 students were in the CE class. The total of students involved in this study to gain quantitative data was 73 students.

In collecting data, integrated test a test consisting of four skills tested) was used. The test was composed of the combination material from the 2013 curriculum and CEFR (Common European Framework of Reference) for English for A1 grade. This test was based on the Common European Framework of Reference for English and the English syllabus from the 2013 curriculum. The CEFR for English was used because the framework addresses the need for English comprehensively. The detail of the English learning target is displayed in its can-do description. Furthermore, the concept of CEFR for English is in line with the 2013 curriculum.

The tests consisted of four skills (Listening, Speaking, Writing, and Reading) set based on the class level. The second grade of senior high school is at A2 level. It was based on The Association of Language Testers in Europe (ALTE) – of which Cambridge English Language Assessment is a founding member – estimates that learners typically take the following guided learning hours to progress between levels. 'Guided learning hours' means time in lessons as well as the tasks you set them to do.

The second grade of senior secondary school was estimated to have been learning English for approximately 180-200 hours, including in A2 level (Cambridge English Language Assessment, 2013, p. 4). The material of the tests was a combination of the two language curriculums. This test was administered to the sample in their English class. The listening test consisted of 20 items of multiple choices with the value of the Pearson correlation (.0663) and Cronbach Alpha 0.776. Deleting some items having low internal item consistency was done. Only items having a good correlation (>0.05) were used. The Reading test was done by answering true or false questions. There were ten items based on a text. The Pearson correlation value gained was 0.441, and the Cronbach Alpha was 0.476. Since having a low value of Pearson correlation, the form of the Reading instrument test was changed into multiple choices. The Speaking test's instruction consisted of five. It has good Pearson correlation and Cronbach alpha values (0.7128 and 0.769). The Writing test consisted of four aspects to test. It has a high value of Pearson correlation (0.850) and Cronbach Alpha (0.884).

The test was given to the sample in two meetings (one meeting was 70 minutes). Listening, Writing, and Reading tests were conducted in the first meeting. At the same time, the Speaking test was done in the following week. The Listening test consisted of two parts about daily activ-

ities. The questions were 20 numbers in multiple-choice form. It took 38 minutes. The recording was played twice. The Writing test was done right after the students did the listening test. The students were asked to compose a passage about Dr. Allan's daily routine based on the chart. The time to complete the passage was 10 minutes. The Reading test, it was last for 15 minutes. Five minutes were used to read the passages about Mr. Miller's and Ms. Lucy's daily routine. Ten minutes were used to answer ten numbers of True-False questions dealt with the passages. For the Speaking test, students were chosen randomly into some groups consisting of three students. Each group had to find a teacher and interview a teacher about her/ his daily routine. The result of the interview was presented in front of the class without bringing any text. The time to deliver the speaking test was seven minutes.

FINDINGS AND DISCUSSION

The aim of this study was to investigate if there was a difference in English achievement among students enrolled in SS and CE classrooms. Besides, this study explored the potential influences of those classrooms on the outcome of English learning achievement. Descriptive statistics and inferential statistics were used to analyze the SS and CE classrooms' impact on students' gains in English learning, as indicated by integrated English test scores. The data gained from the integrated English test is as in Table 1.

Table 1. The Mean Score of the Integrated English Learning Achievement Test

English Learning Achievement Score	Class		Statistics	Stand. Error
	S	Mean	66.3958	1.66
	F	SD	8.11330	
	S	Mean	65.8400	2.06
	M	SD	10.2933	
	C	Mean	57.8125	1.90
	E	SD	9.30295	

Table 1 described that the number of students taking the score to be analyzed was almost equal. Besides, the mean of the three groups was different. SF class was the class with the highest mean, followed by the SM class, and the lowest mean was from the CE class. The mean difference among the three groups was not too much.

Table 1 displays the acquired integrated English learning achievement test score from the three classes of the sample. The SF classroom gains the highest mean score of the average of four English skill scores of 66.39. The SM classroom is the second rank with 65.84 as the final score, and the lowest score is from the CE classroom, 57.81. It implies that being in the SS classroom and the CE classroom affect students' English learning achievement. Likewise, the students attending the English learning process in the SS classroom gain a higher mean score than those in the CE classroom. It is on a par with the view of Aslan (2009) that students in the SS classroom gain better English learning achievement. The elaboration of each skill score is that the order for the reading and speaking scores are about the same as the overall scores (see Figure 1). This finding aligns with O'Neill (2011) that the SS classrooms contribute better achievement on students' reading tests. It is because students in the SS classrooms are more accessible and psychologically secured. This positive feeling also affects students' confidence in performing the speaking test.

On the contrary, the listening and writing scores seem different. In writing skills, the CE classroom came up with a higher score than the SM classroom. It is pretty altered from the three skill scores that always put the CE classroom in the last position. The SM classroom acquires the highest score in the listening test. The result contradicts the avowal from Sax (2017), stating that girls are better at hearing than boys. It is because listening is not merely about hearing. In the listening test, concentration and focus are needed. Female students that are considered to be multitasking are easy to be distracted by other activities. This condition causes the female students' concentration and focus on facing the listening test to be irritated.

Though the overall integrated English learning achievement test score illustrated that the SF classroom was the highest in gaining the score and the SM classroom as the second, each English skill score showed different findings. Figure 1 explains in detail the overall English learning achievement test score.

	SF class	SM Class	CE Class
■ Listening	42,7	45,6	36,2
■ Speaking	65,1	63,4	41,2
■ Reading	90,4	89,3	84,3
■ Writing	69,6	67,4	69,4

Figure 1. Integrated English Learning Achievement Test Score

From Figure 1, the score for listening and writing skills is different from the overall integrated English learning achievement test score. The sequences of the scores were the SF, SM, and CE classrooms from the overall score. Nevertheless, listening and writing skills were not the same. The SM classroom got the highest score (45.6) in three classrooms, then the SF classroom (42.7), and the last level was from the CE classroom (36.2). For writing skills, the CE classroom (69.4) placed the second level from the three classrooms. The SM classroom was the lowest level (67.4), though the variance was not quite considerable.

To check the significance of the mean difference, an analysis of variance was conducted. Before conducting an ANOVA, the basic assumptions (the assumption of random sampling, the assumption of normality (p (.148, .200, .200) > α (.05) for Kolmogorov-Smirnov), and the assumption of homogeneity variances, (F(2, 70) = .314, p = .732. That was, p (.732) > α (.05)) underlying it have been met.

From the testing of assumptions for ANOVA, all of the assumptions were met for the calculation. Based on this finding, ANOVA analysis could proceed. In this present study, the question was addressed to ferret out SS and CE classrooms' main effect on the students' English achievement. To answer the question formulated in this study, one-way ANOVA was used.

Table 2. The Result of One Way ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1113.5	2	556.7	6.4	.003
Within Groups	6047.4	70	86.4		
Total	**7160.885**	**72**			

Table 2 shows that the value of probability (p) obtained was lower than α= 0.05 (0.003< 0.05). It means that there was a significant difference among Single Female, Single Male, and co-educational classrooms in learning English outcomes. This result answers the first research questions. This result is also in line with some previous researches (Best et al., 2010; Blake, 2012; Bradley, 2009; Douglas, 2011; Pahlke et al., 2014; Parker & Rennie, 2002; Pendleton, 2015; Whitlock, 2006; Younger & Warrington, 2002) which focused on the SS and CE classrooms in science and PE, and especially from Laster (2004), Mathers (2008), and O'Neill (2011), which concern on research in language learning, as well as from Aslan (2009) which delved into English learning.

The result of the study reveals that being in the SS classroom benefitted the students in their outcomes in learning English. The result supported the previous study conducted by Aslan (2009). He found that students are in SS classrooms have low anxiety during the learning process since they are of the same sex as the entire class is. The low anxiety stimulates them to be wholly engaged in the classroom during the learning process, not being reluctant to question when they find difficulties in the material they learn and feeling free to express what they feel, causing their psychological security.

Furthermore, to investigate which one was the most effective of the three types of classrooms used as the medium of instruction, the Tukey HSD followed the ANOVA test. Table 3 presents a summary of the result of the Tukey HSD.

Table 3. The Result of Tukey HSD

(I) Class	(J) Class	Mean Difference (I-J)	Std. Error	Sig.
SF	SM	.55583	2.66	.976
	CE	8.58333*	2.68	.006
SM	SF	-.55583	2.66	.976
	CE	8.02750*	2.66	.010
CE	SF	-8.58333*	2.68	.006
	SM	-8.02750*	2.66	.010

*. The mean difference is significant at the 0.05 level.

Table 3 illustrated that the SS classrooms were indicated to be more effective than the CE classroom, especially for the SF classroom. It could be seen from the value of probability (P) from the SF class that it was lower than the significance level (α), .006 < .05. This result indicated that the SF classroom was the most effective classroom for teaching English.

This study was not in line with the research conducted by O'Neill (2011), which stated that males gained higher scores than females did. Nevertheless, the result of this study is in line with Gurian (2011), stating that females have more maturity in their brain dealing with linguistic progression since they have more development in their frontal lobes and occipital lobes where sensory processing happens. This thing supports the ability of females to use their senses in the language is better, and males do. It is why females are considered to be more innovative in language than males.

CONCLUSION

The highlight of this study is a contribution to the knowledge field of gender segregation in EFL students' learning process and achievement. This study contributes insight that the SS classroom significantly influences the second graders of Islamic Senior Secondary School, Central Java, with a significant value on the mean score difference, 0.003. It means that the English learning process in SS classrooms is more effective than in CE classrooms. Therefore, the achievement of English learning reaches more considerable improvement.

From the statistical computing result, the significant difference between the male and female groups of students in the SS classroom and the male and female groups of students who received instruction in a CE classroom reveals that male students in an SS classroom are better than male students in a CE classroom. Female students in a SS classroom are also better than female students in a CE classroom. The differences are found in the speaking and listening test. SS classroom is indicated as a better classroom organization due to its effectiveness in SLA.

The study's result can be the fundamental thought in founding and composing language departments in schools. To create an effective language classroom, the students must be set under gender segregation. This study also implies that teachers, especially English teachers, must understand their students' way of learning to implement the appropriate learning strategies. It is because male and female students learn something in different ways.

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