

A Comparative Study of Single Sex and Co-Educational Institutes  
Regarding Academic Performance: A Study of Multan

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Abstract

The present research study is conducted to find out the comparison of single sex and co-education regarding academic performance. In recent decades there has been debate as to whether students attending single-sex (SS) schools show better academic achievement than students in co-education (CE) schools or students of co-education (CE) show better. In order to study this comparison cross-sectional designs have been used to analyze data and to formulate results. A questionnaire was formulated that was a Likert scale consisting of 27 items. Target population was the students of department of social sciences from Women University Multan and Bahauddin Zakariya University Multan. The main objective of the research is to find out the multiple comparisons of students of single sex and co-ed institutes regarding their CGPAs or academic performance. The results reject the null hypothesis and show that there is no difference of means of importance of both learning styles among students of three subjects (Criminology, Sociology and psychology). At least one mean of students of three subjects (Sociology, Psychology, and Criminology) is different for their importance to both learning types. In Anova all subjects have no difference. While in table Post Hoc Test Sociology and Criminology have difference. Cross-tabulation of CGPA with the respondent opinion that they would not try to miss their classes either in the co-education or single sex institutions shows positive results.

**Keywords:** Co-education, Single Sex Education, Academic Performances, Criminology, Cross-Tabulation.

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## INTRODUCTION

In recent decades there has been debate as to whether students attending single-sex (SS) schools show better academic achievement than students in co-education (CE) schools. Lee and Bryk (1986) found positive effects associated with SS schools for both sexes. Students at SS schools demonstrated higher academic achievement and educational aspirations, with effects generally higher for females. Girls at SS schools did more homework and enrolled in more math courses, and boys attending SS schools enrolled in more math and science courses, than did their counterparts in CE schools. According to the U.S. General Accounting Office on public education, public education evolved from primarily single-sex education for boys to primarily co-education before the turn of the 20th century. In colonial America, formal public education was primarily available to boys; girls were typically educated informally and in the home. Gradually, girls began to be integrated into the public elementary or “common” schools, and by the middle of the 19th century, almost as many girls as boys were attending these schools (Steptoe & Arbor, 2004; Rasheed, 2020). Most of the common schools were small and located in rural areas where the economy of educating boys and girls together may have played a part in the co-educational model. During the 1800s, the desirability of co-education in secondary schools was debated, and opponents cited the need to protect girls both from danger to their health and from boys (Iqbal & Nasir, 2018; Zubaida et al., 2024). Social media plays a big role when it comes to communication between genders. Therefore, it's important to understand how gender stereotypes develop during online interactions. Research in the 1990s suggested that different genders display certain traits such as being active, attractive, dependent, dominant, independent, sentimental, sexy, and submissive when it comes to online interaction (Gauntlett, 2016; Riaz & Safdar, 2018). Even though these traits continue to be displayed through gender stereotypes, recent studies show that this isn't necessarily the case anymore (Herring, 2016; Mahmood & Naz, 2018).

## ACADEMIC PERFORMANCE

In California, the performance of institutes is measured by the Academic Performance Index. Individual difference influences academic performance. Individual differences in academic performance have been linked to differences in intelligence and personality (Von, 2011). Students with higher mental ability as demonstrated by IQ tests and those who are higher in conscientiousness (linked to effort and performance motivation) tend to achieve highly in academic settings (Sikandar et al., 2024; Hassan, 2024). A recent meta-analysis suggested that mental curiosity (as measured by typical intellectual engagement) has an important influence on academic performance in addition to intelligence and conscientiousness (Von, 2011; Al-Masri & Poulin, 2025).

Academic performance is the degree to which a pupil, instructor or the institution has accomplished their brief or long-term educational objectives or goals. Academic performance can be obtained from the annual result or the cumulative GPA system of the institution, which is measured through a proper examination or test system. However, there are certain factors that contribute to the performance level such as confidence, motivation, test anxiety and emotions. Academic performance and its relation to smoking have been broadly considered. Students who execute good academically are less expected to smoke, whereas those whose execution is less smoke much more regularly. Poor personal wellbeing and components related to well-being are known to be related to juvenile smoking (Kinnunen et al., 2016; Shah & Iqbal, 2025).

## CO-EDUCATION IN PAKISTAN

Pakistan is one of the many Muslim countries where most institutes, colleges and universities are single gender although some universities, colleges and institutes are co-educational. In institutes that offer O levels and A levels, co-education is quite prevalent. After the independence of Pakistan in 1947, most universities were co-educational by name but the proportion of women was less than 5%. After the Islamization policies in early 1980s the government established Women's colleges and Women's universities to promote education among women who were hesitant of studying in mixed-sex environment. Today, however, most universities and a large number of institutes in urban areas are co-educational. (Education system of Pakistan, 2017) Following are the objectives of the research

- To find the level of Academic performance in male and females.
- To compare the academic performance of girl's campus and co-ed campuses.

## LITERATURE REVIEW

Talha in 2012 studied the purpose of the study was to investigate differences between Single-Sex school system and Co-Education school system in relation to both academic achievement and learning experiences. An analysis of academic achievement was calculated by averaging students' GPA across schools. Very little difference was found in the results of academic achievement across schools. The students in the SS and CE schools had similar grade point averages, whereas previous studies have shown the females in SS schools tended to have higher academic achievement. Stephan in 2013 operationalizes several supply chain risk sources and investigates their relationships with supply chain performance. The responses of 760 executives from firms operating in Germany reveal that demand side and supply side risks do have a negative impact on performance whereas regulatory, legal and bureaucratic risks, infrastructure risks, as well as catastrophic risks do not. The analysis and results augment previous research regarding the impact of supply chain risks on the operational performance of firms and shareholder value and provide a detailed analysis of supply chain risk sources as contextual variables in strategic decision-making.

Mariah in 2014 studied that exposure to books and high culture provides important academic advantages. But the reasons for this are hotly disputed. Elite closure theory posits that culture merely signals children's elite status to gatekeepers who then grant them unjust advantages. But other theories suggest that scholarly culture provides cognitive skills that improve academic performance, which schools justly reward. We attempt to adjudicate between these theories using data on academic performance from 42 national samples with 200,144 cases from OECD's PISA. We find that a key aspect of scholarly culture, the number of books in the family home, exerts a strong influence on academic performance in ways consistent with the cognitive skill hypothesis, regardless of the nation's ideology, political history, or level of development. Debra in 2017 reviewed the article that author examines the difference between the academic study of personnel resource management and the practical performance of the same discipline in a real-life setting. She frames her discussion in terms of academic publications dealing with the subject in contrast with less analytical, reality-based trade publications. Issues are examined regarding evidence-based management solutions to human resource problems in the light of overall business practice. The author discusses the role played in human resource education by a number of organizations including the Society for Human Resource Management.



RESEARCH METHODOLOGY

The research aims to study the comparison of single sex and co-education institutes regarding academic performance. For this purpose, cross-sectional research design was used and was held on the universities of Multan.

UNIVERSE

The universe of this research was the Bahauddin Zakariya University and The Women University Multan.

TARGET POPULATION

The target population of this research was all the student of Bahauddin Zakariya University and The Women University Multan.

SAMPLING

After deciding the target population, the next step was to define the sampling technique from, which data collected. For this, researcher used multi stage simple random sampling technique. At the first stage, researcher used simple random sampling technique and selected one faculty (faculty of social science). At second stage three departments were selected randomly named Sociology, Criminology ad Psychology. After defining the departments, researcher used simple random technique to access the respondents for getting their response from each selected department because this is not possible for the student researcher to access the whole department that is why researcher got approximately 10% from each selected department total strength. Following table shows the selection of sample.

TABLE 1: The total selected sample size was 136 and questionnaire were distributed among selected students. Only 124 questionnaires were returned. So, the response rate remained 91 percent.

University name		Criminology	Psychology	Sociology
WUM	Total No. of students registered	150	150	76
	No. of students selected	15	15	7
BZU	Total No. of students registered	150	672	320
	No. of students selected	15	67	32

TOOLS OF DATA COLLECTION

As a researcher instrument questionnaire was filled by the respondents. Questionnaire was formulated on the basis of information that was drawn from the review of the relevant literature and knowledge of the concept used in hypothesis.

RAPPORT BUILDING

After the permission was sort from the head of institutions of Women University and Bahauddin Zakarya university Multan, the process of data collection took place. The students were gathered in library and they were given complete guidance about the test. After their consent was taken the process of data, collection proceeded. The students were reluctant to give information but they were given satisfaction that their data would be used only for research purpose and would not be leaked. On various points they showed resistance by showing lack of attention to the questionnaire but our continuous motivation made them attentive towards the questionnaire. In this way, a good rapport was developed with them.

## FIELD EXPERIENCE

The field experience in the institute was motivating but full of hard work. It took continuous devotion to gather reliable form of data.

## CODING

The data gathered in the field was fed in the SPSS software version 20. The sheet for variable view was filled in which each question was given a numbering. Options of each question was given a label which would help in calculations of result. After that, the data sheet was opened and the data was entered. Statistical calculations were done of that entered data.

## DATA ANALYSIS

After collecting data researcher used process of coding for data analysis. The analysis was made by putting data into SPSS software. The tables were received through SPSS (Statistical Package for Social Scientist) and elaborated by the researcher.

## PERCENTAGE

For the description of the basic characteristics of the sample, simple percentage was easily calculated. The percentage is calculated by using the following formula:

Where  $P = F/N \times 100$ , P= percentage, F=Frequency, N=Total no. of frequencies

## CHI-SQUARE

Chi-square is used to find the relation between independent and dependent variables. Chi-square was calculated using the following formula.

$$X^2 = \sum (f_o - f_e)^2 / f_e$$

Where, O= Observed value, E= expected value, S= sum of value

In order to judge the significant of the result, the calculated value of the chi-square compared with the tabulated value at a given degree of freedom. The result was considered significant if the calculated value of the chi-square was greater than value otherwise, it was considered a non-significant.

## ANOVA

One factor analysis of variance also known as Anova, give us a way to make multiple comparisons of several population means. To perform an Anova test, we need to make comparison of two kinds of variations. The formula for calculating Anova is as below.

$F = MST/MSE$  Where,

F= Anova coefficient, MST= mean sum of square due to treatment, MSE= mean sum of square due to error

## POST HOC

Post hoc tests are designed for situations in which the researcher has already obtained a significant omnibus F-test with a factor that consists of three or more means and additional exploration of the differences among means is needed to provide specific information on which means are significantly different from each other.

## CONCEPTUALIZATION AND OPERATIONALIZATION

Conceptualization is the process of taking a constructor concept and reflecting it by given it is a conceptual or theoretical definition of Academic performance, Education, Co-education, Single sex, Institutes

## ACADEMIC PERFORMANCE

Academic performance is the extent to which a student, teacher or institution has achieved their short or long-term educational goals.





EDUCATION

Level of completed qualification reported for a person in any field of study, or highest year of school completed, whichever is the higher.

CO-EDUCATION

The education of both male and female students in the same institution is co-education.

INSTITUTION

Two or more separately accredited colleges or universities under the governance of a single board and under the control or supervision of a single executive head is institution.

DATA ANALYSIS

**TABLE 2:** Percentage distribution of respondents according to their opinion that Single sex provides more environment satisfaction to students.

Category	Frequency	Percent
Strongly Agree	8	6.5
Agree	24	19.4
Neutral	60	48.4
Disagree	22	17.7
Strongly Disagree	10	8.1
Total	124	100.0

Table 2 shows that the 19.4 percent of the respondents were agree with the statement “single sex provides more environment satisfaction to students.” 6.5percent of the respondents were strongly agree with the statement “single sex provides more environment satisfaction to students.” While 48.4percent of the respondents were neutral with the statement “single sex provides more environment satisfaction to students.” And 17.7percent of the respondents were disagreeing with the statement “single sex provides more environment satisfaction to students.” And 8.1 percent of the respondents were strongly disagreeing with the statement “single sex provides more environment satisfaction to students.” It means that mostly respondents were agreeing with the statement.

**TABLE 3:** Percentage distribution of respondents according to their opinion that Students can practice their views more comfortably in single sex institutes.

Category	Frequency	Percent
Strongly Agree	6	4.8
Agree	38	30.6
Neutral	36	29.0
Disagree	28	22.6
Strongly Disagree	16	12.9
Total	124	100.0

Table 3 shows that the 30.6percent of the respondents were agree with the statement “students can practice their views more comfortably in single sex institutes.4.8percent of the respondents were strongly agree with the statement “single sex provides more environment satisfaction to students.” 29 percent of the respondents were neutral with the statement “single sex provides more environment satisfaction to students.” While 22.6percent of the respondents were disagree with the statement “single sex provides more environment satisfaction to students.” 12.9percent of the respondents were strongly disagreeing with the statement “single sex provides more environment satisfaction to students.” It means that mostly respondents were agreeing with the statement “single sex provides more environment satisfaction to students.”



**TABLE 4:** Percentage distribution of respondents according to their opinion that they would be more sincere toward my studies in single sex.

Category	Frequency	Percent
Strongly Agree	16	12.9
Agree	26	21.0
Neutral	42	33.9
Disagree	26	21.0
Strongly Disagree	14	11.3
Total	124	100.0

Table 4 shows that 12.9 percent of the respondents were strongly agree with the statement “I would be more sincere toward my studies in single sex.” 21percent of the respondents was agree with the statement “I would be more sincere toward my studies in single sex.” 33.9percent of the respondents were strongly neutral with the statement “I would be more sincere toward my studies in single sex.” 21percent of the respondents were disagree with the statement “I would be more sincere toward my studies in single sex.” 11.3percent of the respondents were strongly disagreeing with the statement “I would be more sincere toward my studies in single sex.” It means that the mostly respondents were agreed with the statement “I would be more sincere toward my studies in single sex.”

**TABLE 5:** Percentage distribution of respondents according to their opinion that A Single sex institute provides more persistence.

Category	Frequency	Percent
Strongly Agree	10	8.1
Agree	28	22.6
Neutral	40	32.3
Disagree	30	24.2
Strongly Disagree	16	12.9
Total	124	100.0

Table 5 shows that the 22.6percent of the respondents were agree with the statement “single sex institute provide more persistence.” 8.1percent of the respondents were strongly agree with the statement “single sex institute provide more persistence.” percent 23.8percent of the respondents were disagreeing with the statement “single sex institute provide more persistence.” 12.7percent of the respondents were strongly disagreed with the statement “single sex institute provide more persistence.” It means that mostly respondents were agreed with the statement “single sex institute provide more persistence.”

**TABLE 6:** Percentage distribution of respondents according to their opinion that Single sex and co-education provide equal career opportunities to students.

Category	Frequency	Percent
Strongly Agree	30	24.2
Agree	46	37.1
Neutral	24	19.4
Disagree	16	12.9
Strongly Disagree	8	6.5
Total	124	100.0

Table 6 shows that 37.1percent respondents were agree with the statement “single sex and co-education provide equal career opportunities to students.” While 24.2percent respondents were strongly agreed with the statement, “single sex and co-education provide



equal career opportunities to Students.” 19.4percent respondents were neutral with the statement “single sex and co-education provide equal career opportunities to students.” And 12.9percent respondents were disagreeing with the statement “single sex and co-education provide equal career opportunities to students.” 6.5percent respondents were strongly disagreeing with the statement “single sex and co-education provide equal career opportunities to students.” It means that the mostly respondents were agreed with the statement “single sex and co-education provide equal career opportunities to students.”

**TABLE 7:** Percentage distribution of respondents according to their opinion that Single sex and co-education have equal academic attainments

Category	Frequency	Percent
Strongly Agree	30	24.2
Agree	48	38.7
Neutral	16	12.9
Disagree	22	17.7
Strongly Disagree	8	6.5
Total	124	100.0

Table 7 shows that the 38.7percent of the respondents were agree with the statement “single sex and co-education have equal academic attainments.” While 24.2percent of the respondents were strongly agree with the statement “single sex and co-education have equal academic attainments.” 12.9percent of the respondents were neutral with the statement “single sex and co-education have equal academic attainments.” 17.7percent of the respondents were disagree with the statement “single sex and co-education have equal academic attainments.” 6.5percent of the respondents were strongly disagreeing with the statement “single sex and co-education have equal academic attainments.” It means that mostly respondents were agreed with the statement “single sex and co-education have equal academic attainments.”

**TABLE 8:** Percentage distribution of respondents according to their opinion that Level of confidence and smartness gained is same in co-ed and single sex institute.

Category	Frequency	Percent
Strongly Agree	22	17.7
Agree	36	29.0
Neutral	22	17.7
Disagree	22	17.7
Strongly Disagree	22	17.7
Total	124	100.0

Table 8 shows that the 29percent of the respondents were agree with the statement “level of confidence and smartness gained is in co-education and single sex institute.” 17.7percent of the respondents were strongly agree with the statement “level of confidence and smartness gained is in co-education and single sex institute.” 17.7percent of the respondents were neutral with the statement “level of confidence and smartness gained is in co-education and single sex institute.” 17.7percent of the respondents were disagree with the statement “level of confidence and smartness gained is in co-education and single sex institute.” 17.7percent of the respondents were strongly disagreeing with the statement “level of confidence and smartness gained is in co-education and single sex institute.” It means that the mostly respondents were agreed with the statement “level of confidence and smartness gained is in co-education and single sex institute.”





**TABLE 9:** Percentage distribution of respondents according to their opinion that that both co-education and single sex institute provide opportunities for extracurricular activities.

Category	Frequency	Percent
Strongly Agree	28	22.6
Agree	44	35.5
Neutral	36	29.0
Disagree	14	11.3
Strongly Disagree	2	1.6
Total	124	100.0

Table 9 shows that 35.5percent respondents were agree with the statement “Both co-education and single sex institute provide opportunities for extracurricular activities.” 22.6percent respondents were strongly agree with the statement “Both co-education and single sex institute provide opportunities for extracurricular activities.” 29percent respondents were neutral with the statement “Both co-education and single sex institute provide opportunities for extracurricular activities.” 11.3percent respondents were disagree with the statement “Both co-education and single sex institute provide opportunities for extracurricular activities.” 1.6percent respondents were strongly disagree with the statement “Both co-education and single sex institute provide opportunities for extracurricular activities.” It means that mostly respondents were agreed with the statement “Both co-education and single sex institute provide opportunities for extracurricular activities”.

**TABLE 10:** Percentage distribution of respondents according to their opinion that Co-education practices discipline similar to that of single sex institute.

Category	Frequency	Percent
Strongly Agree	18	14.5
Agree	34	27.4
Neutral	40	32.3
Disagree	20	16.1
Strongly Disagree	12	9.7
Total	124	100.0

Table 10 shows that the 27.4percent of the respondents were agree with the statement “co-education practices similar to that of single sex institutes.” 14.5percent of the respondents were strongly agree with the statement “co-education practices similar to that of single sex institutes.” 32.3percent of the respondents were neutral with the statement “co-education practices similar to that of single sex institutes.” 16.1percent of the respondents was disagreeing with the statement “co-education practices similar to that of single sex institutes.” 9.7percent of the respondents were strongly disagreeing with the statement “co-education practices similar to that of single sex institutes.” It means that mostly respondents were agreeing with the statement “co-education practices similar to that of single sex institutes.”

**TABLE 11:** Percentage distribution of respondents according to their opinion that they would be open to suggestions and opinions and is worthy of praise in both single sex and co-education institutes.

Category	Frequency	Percent
Strongly Agree	14	11.3
Agree	48	38.7



Neutral	46	37.1
Disagree	6	4.8
Strongly Disagree	10	8.1
Total	124	100.0

Table 11 shows that the 38.7percent of the respondents were agree with the statement “I would be open to suggestions and opinions and is worthy of praise in both single sex and co-education.” 11.3percent of the respondents were the strongly agree with the statement “I would be open to suggestions and opinions and is worthy of praise in both single sex and co-education.” 37.1percent of the respondents were the neutral with the statement “I would be open to suggestions and opinions and is worthy of praise in both single sex and co-education.” 4.8percent of the respondents were disagree with the statement “I would be open to suggestions and opinions and is worthy of praise in both single sex and co-education.” 8.1percent of the respondents were the strongly disagree with the statement “I would be open to suggestions and opinions and is worthy of praise in both single sex and co-education.” It means that mostly respondents were agreed with the statement “I would be open to suggestions and opinions and is worthy of praise in both single sex and co-education.”

**TABLE 12:** Percentage distribution of respondents according to their opinion that they would not try to miss my classes either in the co-education or in single sex institutions.

Category	Frequency	Percent
Strongly Agree	42	33.9
Agree	38	30.6
Neutral	12	9.7
Disagree	22	17.7
Strongly Disagree	10	8.1
Total	124	100.0

Table 12 shows that 30.6percent of the respondents were agree with the statement “I would not try to miss my classes either in the co-education or single sex institutions.” 33.9percent of the respondents were strongly agree with the statement “I would not try to miss my classes either in the co-education or single sex institutions.” 9.7percent of the respondents were neutral with the statement “I would not try to miss my classes either in the co-education or single sex institutions.” 17.7percent of the respondents were disagreeing with the statement “I would not try to miss my classes either in the co-education or single sex institutions.” 8.1percent of the respondents were strongly disagree with the statement “I would not try to miss my classes either in the co-education or single sex institutions.” It means that mostly respondents were agreeing with the statement “I would not try to miss my classes either in the co-education or single sex institutions.”

**TABLE 13:** Percentage distribution of respondents according to their opinion that co-education produces diverse human beings as compared to single sex education.

Category	Frequency	Percent
Strongly Agree	16	12.9
Agree	40	32.3
Neutral	28	22.6
Disagree	14	11.3
Strongly Disagree	26	21.0
Total	124	100.0



Table 13 shows that 12.9 percent of the respondents were strongly agree with the statement “I feel co-education diverse human beings as compared to single sex education.” 32.3percent of the respondents were agreeing with the statement “I feel co-education diverse human beings as compared to single sex education.” While 22.6percent of the respondents were neutral with the statement, “I feel co-education diverse human beings as compared to single sex education.” 11.3% of the respondents were disagreeing with the statement “I feel co-education diverse human beings as compared to single sex education.” 21percent of the students were strongly disagreeing with the statement “I feel co-education diverse human beings as compared to single sex education.” It means that mostly respondents were agreed disagree with the statement “I feel co-education diverse human beings as compared to single sex education.”

Table 14: ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	143.932	3	47.977	2.629	.053
Within Groups	2189.907	120	18.249		
Total	2333.839	123			

The significant results of the above table shows that at least one group of students is different for their importance to both type of institutions. It means at least one group of students with any of three subjects had less importance for both type of institute simultaneously. To identify the group, which had differences, Post Hoc test was applied. The results of post Hoc (LSD) are described in table 14. At least one mean of students of three subjects (Sociology, Psychology, and Criminology) is different for their importance to both learning types.

The post hoc test in above table shows that the group of criminology and sociology have different means for the preference they gave to both type of education institutions. There is an association between CGPA of the student and their preference to miss the classes.

TABLE 15: POST HOC TEST MULTIPLE COMPARISONS (LSD)

(I) Field of study.		(J) Field of study?				95% Confidence Interval	
			Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
dimension2	Sociology	psychology	.876	.912	.339	-.93	2.68
		dimension3					
	Psychology	criminology	-1.637	.966	.093	-3.55	.28
		dimension3					
	Criminology	sociology	-.876	.912	.339	-2.68	.93
		dimension3					
		criminology	-2.513*	.986	.012	-4.46	-.56
		sociology	1.637	.966	.093	-.28	3.55
		dimension3					
		psychology	2.513*	.986	.012	.56	4.46

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



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