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# Perceptions of Secondary School Female Teachers' About the Effects of Class Size on Learning Outcomes

**Abstract**   The main aim of this study was to see the perceptions of female teachers of secondary schools about the relationship between class size and students learning outcomes. Variable Learning outcome (LO) was selected for comparing teaching in overcrowded classes versus small-sized classrooms. Primary data were collected from the same teachers who had the experience of teaching both overcrowded classes and small-sized classes. For overcrowded classes, it was hypothesized that teachers could very effectively achieve the targeted learning outcomes in small classes, whereas it is quite challenging for the overcrowded class teachers to achieve the targets. Reliability tests were carried out to check the consistency of the answers from respondents. The test Cronbach's alphas yielded acceptable to very good range. Learning outcomes (LOO) 4.04, Learning outcomes (LOS) 4.72. These results were further checked and reinforced through the use of One-sample t-tests. The majority of the same teachers, on the basis of the same statistical tests, have expressed that small-sized classrooms are relatively more appropriate for teaching.

**Key Words:** Female Secondary Schools, Class Size, Learning Outcomes (LO)

## Introduction

The overcrowded classroom is not only the problem of Pakistan, but it becomes a universal problem now a day. According to Kerr (2011), New York has faced the largest number of overcrowded classes in the last ten years. Policymakers have different views of class size according to Carbone (1999), an ideal strength is 30 students, as the class will not be noisy, teachers will be audible, and they could keep eye contact, there will be no complaint of dust, smell, suffocation or invisibility of blackboard. To achieve the desired output, normal class size is preferred as it maintains a balance between teachers and students. Teachers can keep check and balance upon every student, and slow learners or struggling students cannot be ignored. Amarat (2011) added that in overcrowded classes, the teacher might face several problems like vandalism theft, failure of educational facilities, destruction of property, etc. Class size plays an important role in the teaching-learning process as overcrowded classes can't be checked properly& merely lecture method is adopted, which makes students just passive learners. Learning outcomes can't be attained as students become passive learners only. They can't perform any activity, and as a result, students remain shy & incompetent. It reduces the depth of thinking, and their academic performance is affected and suffered (Cuseo, 2011). This can cause the failure of that particular teaching-learning process. The large class size is a relative variable that has generally caused contrary effects on students learning, mediated primarily by lower student's level of engagement or involvement with the teacher, with classmates and with the subject matter (Keachie,1986). Reducing class size will help to improve students 'outcomes and significant achievements in the teaching-learning process (Monks & Schmidt, 2010). Small classes allow the teachers to engage in individualized teaching (Blatchford *et al.:*, 2011). Wilson (2006) found that smaller classes are very effective for students learning & promote their achievements because students get the individual attention of the teachers.

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## Statement of the Problem

The debate that whether the class size in secondary education affects the teaching-learning achievement or not is the root cause to initiate this research. The aim of this study is to investigate whether there is a connection between the number of students in a class and their resultant performance. This researcher intends to examine any variations in the progress and achievement levels of the two extremes of large and small classes.

## Research Objectives

To investigate the relationship and perceptions of female secondary school teachers towards the effects of class size on learning outcomes.

## Research Questions

1. *Is there any relationship between learning outcomes and class size in a teaching learning situation?*
2. *What are the perceptions of female teachers of secondary schools towards the effects of class size on learning outcomes?*

## Significance of the Study

This study is designed for beginning a discussion for future studies and for contributing to teacher training programs, which may enhance teachers, teaching abilities.

## Literature Review

It is widely recognized that we need to know more about the effects of class size on classroom interactions and pupil behaviour. This paper extends research by comparing effects on pupil classroom engagement and teacher-pupil interaction and examining if effects vary by pupil attainment level and between primary and secondary schools. Systematic observations were carried out on 686 pupils in 49 schools. Multilevel regression methods were used to examine relationships between class size and observation measures, controlling for potentially confounding factors like pupil attainment. At primary and secondary levels, smaller classes led to pupils receiving more individual attention from teachers and having more active interactions with them. Classroom engagement decreased in larger classes, but contrary to expectation, this was particularly marked for lower attaining pupils at the secondary level. Low attaining pupils can therefore benefit from smaller classes at the secondary level in terms of more individual attention and facilitating engagement in learning. In many countries over the world, there has been a widely reported debate over the educational consequences of class size differences.

## Definition of Class Size

Class size refers to the number of students in a class or the average number of students per class in an institution. Class size refers to the number of students in a given course or classroom, specifically either (1) the number of students being taught by individual teachers in a course or classroom or (2) the average number of students being taught by teachers in a school, district, or education system. The term may also extend to the number of students participating in learning experiences that may not take place in a traditional classroom setting, or it may also refer to the total number of students in a particular grade level or "class" in a school.

## How Can We Define a Small-Sized Class?

Researchers have found that the objectives of a learning process can be achieved When class size is reduced to less than 20 students. All over the world, educationists believed that small classes are beneficial for the pupil because the teacher can pay individual attention to all the students, especially at the secondary level where the content level is more challenging.

The class size debate has included a broad spectrum of positions. Haddad wrote that "an increase in class size does not necessarily lead to a decrease in the level of academic achievement. Likewise, a decrease in class size does not guarantee an improvement in the social environment of learning. More important is what the teacher does with the opportunities provided by the size of the class. In the absence of a statistically established basis for optimum class size.

Publication in 1978 of a major review of 41 studies on class size and achievement by the Educational Research Service also seemed to confirm that reducing class size alone would not increase pupil performance (Cuban, 1993). Since that time, this position also has been advanced by Hanushek in a meta-analysis of 187 studies of production and expenditure relationships in schools (Hanushek 1999). In his paper, Hanushek (1999) claimed, "The results are startlingly consistent in finding no strong evidence that teacher-student ratios, teacher education, or teacher experience have the expected positive effects on student achievement". Hanushek supported this assertion more recently by pointing out, "the teacher Pupil ratio fell from one teacher to 26 students in 1960 to one teacher to 17 students in 1990, and during the same period, the percentage of teachers with a master's degree more than doubled from 23% to 56% reading achievement is essentially the same in the 1990s as it was in the early 1970s; science achievement has fallen, and math achievement is only slightly improved" (Hanushek 1999).

## Research Methodology

### Population

The aim of this research is to analyze the effect of class size on the teaching-learning process at the secondary level. Thus the required data for this purpose were collected from teachers who teach to the secondary level students of public sector girls secondary schools located in district Mardan which consists of two tehsils Mardan and Takhtbhai.

The population of the study thus comprises 114 governments girl's high schools in district Mardan. Total students studying in these schools are 20475 in number. Out of the total, 14 schools are situated in urban areas, and 100 schools are in rural areas. The total number of teachers serving in these schools is 575 in number.

## Sample

Due to time and financial limitations, the researcher of this study has selected 12 schools from both tehsils of district Mardan. In this selection, stratified-cum-random sampling techniques were used. In the first stage, we stratified the total 114 schools into two major groups – one having large-sized classes and the second having small-sized classes. In the second stage, we used a random sampling method (lottery method) and selected 6 schools in each of the two major groups. A total of 120 teachers have been selected from the 575 teachers (10 teachers from each school who were teaching to secondary classes) who were teaching and have experience of teaching in both overcrowded and small-sized classes. Respondents were Requested/guided to answer both questionnaires of overcrowded classes and small-sized classes.

## Research Instrument

### Questionnaire

(Two parts of a) self-administered questionnaire – the first part containing questions on large-sized classroom teaching and the second part containing questions on small-sized classroom teaching – was used for data collection. This questionnaire is attached at Annexure I. Questionnaires were filled in by the teachers to get feedback regarding constraints faced by them while teaching overcrowded classes versus small-sized classes. Thus there were, in fact, two types of questionnaire used.

## Questionnaire for Overcrowded Classes

### Variable: Learning Outcomes (LO)

**LO1**: *Overcrowded class is a barrier towards the communication skills building of students.*

LO2: *Overcrowded classes are unsuccessful in the confidence-building of students.*
LO3: *Students learning achievement is very low in overcrowded classes.*
LO4: *In overcrowded classes teaching objectives are difficult to achieve.*

The above reported 4 items/questions regarding Learning outcomes (LO) assumed that overcrowded/large class is not conducive towards learning outcomes. All questions are regular, and none is Reverse.

## Questionnaire for Small-Sized Classes
### Variable: Learning Outcomes (LO)

LO_S1: Small classes provide an opportunity to develop the communication skills of students.
LO_S2: Small classes are successful in the confidence-building of students.
LO_S3: Students learning achievement is very high in small classes.
LO_S4: In small classes teaching objectives can easily achieve.

The above-reported questions were asked from the respondents to collect responses for small-sized classes; we have expected that favorable conditions are provided for learning outcomes.

## Reliability Test of Questions/Items

Before converting these items/questions into their respective variables, we need to carry out a reliability test of each of the seven variables. A reliability test is carried out to determine the consistency or stability of the tool; here scale of a variable consisting of several questions is the tool that we used in cases of seven variables.

## Frequency Analysis and Descriptive Statistics

Frequency analysis has been carried out for counting out the number of yes or no responses. A descriptive statistics tool was used to measure average or mean value of various variables, along with its standard deviations and minimum-maximum ranges.

## One Sample T-Test

One sample t-test has been used to evaluate the statistical significance of various variables of interest already discussed. One-sample t test is capable of showing whether or not the mean value of a variable differs from mid- neutral-point on Likert scale measuring on 1 to 5, and if differs negatively or positively then that difference is statistically significant or not.

## Data Analysis, Findings and Summary

Variables and items / questions introduced

## Variable: Learning Outcomes (LO)

LO1: *Overcrowded class is a barrier towards the communication skills building of students.*
LO2: *Overcrowded classes are unsuccessful in confidence building of students.*
LO3: *Students learning achievement is very low in overcrowded classes.*
LO4: *In overcrowded classes teaching objectives are difficult to achieve.*

The above reported 4 items/questions regarding Learning outcomes (LO) assumed that overcrowded /large class is not conducive towards learning outcomes. all questions are regular and none is Reverse.

For small-sized classes, we have expected that favorable conditions are provided for learning outcomes. the following four questions were used to collect responses from the teachers.

LO_S1: Small classes provide opportunity to develop the communication skills of students.
LO_S2: Small classes are successful in confidence building of students.
LO_S3: Students learning achievement is very high in small classes.
LO_S4: In small classes teaching objectives can easily achieved.

## Items/Questions-Wise Analysis

### Learning Outcomes (LO)

Results of the frequency analysis carried out to evaluate four questions on learning outcomes (LO) in the Over-crowded classes are provided in Table 1.

**Table 1.** Frequency analysis of questions on learning outcomes in overcrowded classes (LO)

| Questions | Options | | | | |
|-----------|---------------------|-----------|---------|--------|--------------------|
|           | Strongly Disagreed | Disagreed | Neutral | Agreed | Strongly Agreed |
| LO1       | 2                   | 3         | 2       | 22     | 31                 |
| LO2       | -                   | 10        | 5       | 13     | 32                 |
| LO3       | 1                   | 8         | 4       | 16     | 31                 |
| LO4       | -                   | 4         | -       | 22     | 34                 |
| Total     | 3                   | 24        | 11      | 73     | 128                |

Regarding learning outcomes (LO), it was assumed that in overcrowded classes learning outcomes cannot be achieved, the majority of the respondents (Agreed=73& strongly agreed =128) have shown their agreement on this concern against 3 & 24 respondents who strongly disagreed and disagreed with the questions raised.

Results of the frequency analysis carried out to evaluate four questions on learning outcomes (LO) in small-sized classes are provided in Table 2.

**Table 2.** Frequency analysis of questions on learning outcomes in small-sized classes (LO)

| Questions | Options | | | | |
|-----------|---------------------|-----------|---------|--------|--------------------|
|           | Strongly Disagreed | Disagreed | Neutral | Agreed | Strongly Agreed |
| LO1       | 1                   | 2         | -       | 15     | 42                 |
| LO2       | -                   | -         | -       | 29     | 31                 |
| LO3       | -                   | -         | -       | 12     | 48                 |
| LO4       | -                   | -         | -       | -      | 60                 |
| Total     | 1                   | 2         | -       | 56     | 181                |

For small-sized classes, we have assumed that favorable conditions are provided for learning outcomes in small-sized classes; the above reveals that the majority of the respondents) have agreed (56) and strongly agreed (181) against disagreed and strongly disagreed (3) with the questions raised.

## Reliability Test of Questions/Items

Before converting these items/questions into their respective variables, we need to carry out a reliability test Using SPSS, we carried out reliability test of the various questions

| Reliability test of questions/items of overcrowded classes and small class size | |
|------------------------------------------------------------------|------------------|
| Variables                                                        | Cronbach's Alpha |
| Learning outcomes (LO) over crowded                              | 0.964            |
| Learning outcomes (LO_S) small class size                        | 0.682            |

Crone Bach's Alpha of learning outcomes (LO) estimate in 0.90s ranges which are considered the best Alphas however for small class size learning outcomes (LO) estimate at 0.663 and 0.682 are in poor range but acceptable.

## Analyzing Variables Using one–Sample T-Test

The one-sample t-test is capable of showing whether or not \the mean value of a variable differs from

mid- neutral-point on the Likert scale measuring on 1 to 5, and if it differs negatively or positively, then that difference is statistically significant or not. If the difference is positive (that is, if the mean value is higher than mid-point=3) and statistically significant, results would be considered as respondents are agreeing with points raised in the items/questions asked. Conversely, if the difference is negative (mean lower than mid-point) and statistically significant, results would be considered as disagreement with points raised. In case the difference is statistically insignificant, results would be considered as equal to a neutral position; that is, respondents are neither agreeing nor disagreeing with the point.

## One-Sample T-Test of Variable Learning Outcomes (in overcrowded class)

Carrying out a One-sample t-test, using SPSS for variable Learning outcomes (LOO), we get the results provided in Tables 3 & 4.

**Table 3.** One-Sample Statistics of variable Learning outcomes (LOO)

|  | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| LOO | 60 | 4.2417 | .97421 | .12577 |

**Table 4.** One-Sample Test of variable learning outcomes (LOO)

| | Test Value = 3 | | | | | |
|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | |
| | T | df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
| LOO | 9.873 | 59 | .000 | 1.24167 | .9900 | 1.4933 |

The results of One-sample t test given in table 3 indicates that the mean value of variable Learning outcomes (LOO) estimates at 4.2417 while panel (b) of the table shows that the stated mean value differs from the midpoint (test value = 3) by a mean difference = 1.24167. Panel (b) of Table 3 also indicates that this mean difference is statistically significant at t = 9.873 (p-value = 0.000), suggesting that variable Learning outcomes (LOO) are statistically significantly higher, showing respondent agreed with the questions on Learning outcomes (LOO) in overcrowded classes.

Item-wise analysis, variable-wise analysis and now One-sample t-test, all three analyses of variable Learning outcomes (LOO), are showing one and the same results that respondents on average agree that overcrowded/large class is not conducive towards learning outcomes.

## One-Sample T-Test of Variable Discipline (in small-sized class)

### One-Sample T-Test of Variable Learning Outcomes (in small-sized class)

Carrying out a One-sample T-Test, using SPSS for variable Learning outcomes (LOS), we get the results provided in Tables 5 & 6.

**Table 5.** One-Sample Statistics of variable Learning outcomes (LOS)

|  | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| LOS | 60 | 4.7250 | .37024 | .04780 |

**Table 6.** One-Sample Test of variable learning outcomes (LOS)

| | Test Value = 3 | | | | |
|---|---|---|---|---|---|
| | | | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
| | T | Df | | | Lower | Upper |
| LOS | 36.090 | 59 | .000 | 1.72500 | 1.6294 | 1.8206 |

The results of the One-sample T-Test given in table 5 indicates that the mean value of variable Learning outcomes (LOS) estimates at 4.7250, while panel (b) of the table shows that the stated mean value differs from the midpoint (test value = 3) by a mean difference = 1.72500. Panel (b) of Table 5 also indicates that this mean difference is statistically significant at t = 36.090 (p-value = 0.000), suggesting that variable Learning outcomes (LOS) are statistically significantly higher showing respondent agreed with the questions on Learning outcomes (LOS) in small-sized classes.

Item-wise analysis, variable-wise analysis and now One-sample t-test, all three analyses of variable Learning outcomes (LOS), are showing one and the same results that respondents, on average, agree that small-sized class is conducive towards learning outcomes.

## Summary of Findings

Learning outcomes (LO), it was assumed that in overcrowded classes learning outcomes cannot be achieved; the majority of the respondents (Agreed=73 & strongly agreed =128) have shown their agreement on this concern against 3 & 24 respondents who strongly disagreed and disagreed with the questions raised. For small-sized classes, we have assumed that favorable conditions are provided for learning outcomes in small-sized classes; the result reveals that the majority of the respondents) have agreed (56) and strongly agreed (181) against disagreed and strongly disagreed (3) with the questions raised.

The results of the One-sample T-Test disclose that the mean value of variable Learning outcomes (LOO) estimates at 4.2417, and the mean value differs from the midpoint (test value = 3) by a mean difference = 1.24167, which is statistically significant at t = 9.873 (p-value = 0.000), suggesting that variable Learning outcomes (LOO) are statistically significantly higher showing respondent agreed with the questions on Learning outcomes (LOO) in overcrowded classes. Item-wise analysis, variable-wise descriptive statistics and now One-sample t-test, all three analyses of variable Learning outcomes(LOO), are showing one and the same results that respondents on average agree that overcrowded/large class is not conducive towards learning outcomes.

The results of the One-sample T-Test indicate that the mean value of variable Learning outcomes (LOS) estimates at 4.7250 and mean value differs from the midpoint (test value = 3) by a mean difference = 1.72500, which is statistically significant at t = 36.090 (p-value = 0.000), suggesting that variable Learning outcomes (LOS) is statistically significantly higher showing respondent agreement with the questions on Learning outcomes (LOS) in small-sized classes. Item-wise analysis, variable-wise descriptive statistics and now One-sample t-test, all three analyses of variable Learning outcomes (LOS), are showing one and the same results that respondents on average agree that small-sized class is conducive towards learning outcomes.

## Conclusion

The following conclusions are drawn on the basis of research findings summarized in the preceding section. The majority of the same teachers, on the basis of the same statistical tests, have found to express that small-sized classrooms are relatively more appropriate for learning outcomes (LOS) of the students. One-sample t test further reinforced that teaching in small-sized class rooms happens to be relatively more proper and efficient than in overcrowded class rooms.

## Recommendation

In light of the findings of this study summarized above and conclusions drawn, the following recommendations are presented for their appropriate implementations.

1.  It is recommended that the average number of students being taught by teachers in a school, district, or education system must be according to the national policy.
2.  Policies towards class size should be revised according to the need of preset outcomes.
3.  Trainings can help in capacity building of large class size teachers so they may create more learning opportunities and more participation and activity oriented in the classrooms.

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