# Identification and Statistical Analysis of the Problems Associated with Edusat based Distance Learning with Special Reference to Madhya Pradesh Bhoj (Open) University, Bhopal

**Daulat Singh, Rakesh Shrivastava, Dinesh Varshney**

***Abstract— This Paper is an attempt to understand the problems associated with education imparted in distance learning mode by Bhoj Open University, Bhopal, Madhya Pradesh. The paper also deals with the tentative possible solutions to minimise the problems. A study was conducted on 80 students of 2centres of different regions and data was collected related to hub and 40 SIT's (i.e. BER (Bit Error Rate), Bandwidth, number of operation days, number of recorded and live lectures telecasted) to understand the nature of the various problems. A detailed analysis was performed using SPSS 22.0 on the primary data collected. On the basis of observations and interpretation of the analysis the present study attempts to categories the problems and suggests possible solutions to make the education imparted though edusat satellite more effectively.***

***Index Terms—Edusat – Satellite dedicated for education, SIT – Satellite. Interactive terminals, BER – Bit Error Rate, Bandwidth – the amount of data that can be carried from one point to another in given time period. (Usually a second).***

## I. INTRODUCTION

Globally distance education imparted though satellite and other mode of communication is making a huge contribution in educating peoples of various age groups. It is being established as a effective, efficient and more popular then traditional and conventional education. The overall concept of the distance mode enables adult learner to study along with competing different priorities of profession, home and family and travel. The distance mode of learning gives excellent control over time, place and priorities. There are six basic elements used to define distance education i.e the use of technology and technical media (for example:- Websites, portals, ppt's, audio visual films etc.), the provision of two way communication to enable online communication

Between teacher and student group, the influence of educational institute which distinguishes distance education from private study, the separation of learner and teacher as opposed to face to face teaching, provision of counseling and periodic meetings to monitor and review the progress and to solve problems and the self directed nature of learners involvement [1].

The distance learning is not a very old phenomenon hence lot of development is happening throughout the world in this field. As every new concept faces problems and challenges, hence same is true for distance education also. There are four major components on which the effectiveness and success of distance education depends, namely technology used for enabling two way communication, content (online, offline, print), periodic reviews for monitoring of delivery and corrective actions and assessment. Previous studies conducted in technological advanced countries suggest that technology problems contribute majorly to the failure of distance education. A study was conducted on the students taking courses in distance mode at Mississippi Gulf Coast Community College program on issue pertaining to the equipment and technology operating correctly. The results from three groups spread over the different sites showed that only 42% agreed with the statement that the equipment and technology operated correctly [2]. Another study suggests that unanticipated technical problems with the system negatively effect the class and shortened the class time. In one session the connection was lost twice prior to the student's arrival and ten times during the actual session. During this particular session there was never more than a four-minute period before the connection to one of the sites was lost. [3]. In this chapter a study was conducted to understand the problems associated with distance education program at Bhoj Open University, Bhopal, Madhya Pradesh, India. This study was conducted on 100 students of 2 centers of different regions and data was collected related to the central hub and 40 SIT's (number of operation days, number of recorded and live lectures telecasted, BER (Bit Error Rate) observed during operation, Bandwidth etc.) to understand the nature of various problems [4]. A detailed analysis was performed using SPSS 22.0 on the primary data collected to scientifically test the nature of the problem and other factors associated region wise and category wise. On the basis of observations and interpretation of the analysis the present chapter attempts to categories the problems and suggests possible solutions to make the education imparted though Edusat satellite more effective and to identify the impact of problems on various other factors (number of days of

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operation, opinion of students etc) region wise and category wise (Rural, Urban, Tribal) and suggest possible solutions to minimize the problems and its impact.

## II. METHODOLOGY

While conducting the studies, we aimed at the following broad objectives:

a) To find out the reasons which may cause in decrease the number of students in classes and finally result in failure of the system

b) To investigate the reason this may result in lack of interest in attending the classes in different regions.

c) To investigate the opinion of students of different regions in which center is located and category of the center

d) To investigate the effect of problems on the number days of operations.

To achieve the broad objective various statistical techniques were applied to identify dependency and impact of various factors and opinion of the student because of these factors.

The overall analysis was conducted on data collected from100 students with the help of a structured questionnaire consisting of nine items of two centers and factual data collected from hub and 40 SIT's during the days of operations.

The paper aims to identify the dependency of the nature of problem with respect to region in which center is located and category of the center (rural, urban or tribal). We have also attempted to analyze the dependency on number of operational days on the region and the impact of the problems on the total number of days of operation. The above analysis helped us to specifically identify and categorize the problems under different categories namely Technology Problems, System Problems, Infrastructure Problems, Resource Problems and Operational Problems on the basis of the percentage of the variance observed. The communalities were calculated on the nature of problems as per section 6.3. Factor analysis was done to identify the percentage of variance of the problems with regards to the region in which the center is located and category of the center. We have also tried to analyze with Crosstabs the opinion of the students enrolled for various courses in different regions and different categories of centers.

## III. RESULTS AND STATISTICAL DISCUSSIONS

The findings of the present study are summarized as (please see Table A to W).

Extraction Method: Principal Component Analysis.

### A. *Interpretation:*

Five factors identified by present study explain 63.764 per cent of the variance share by the original variables.

1. The first factor labeled as "**Technology problem** "accounted for the greater part of the variance which was 14.622 percent.
2. The second factor labeled as "**System problem**" accounted for the part of the variance which was 12.052 percent.
3. The third factor labeled as "**Infrastructure problem**" accounted for the part of the variance which was 9.584 percent.
4. The fourth factor labeled as "**Resource problem**" accounted for the part of the variance which was 9.035percent.
5. The fifth factor labeled as "**Operational problem**" accounted for the part of the variance which was 8.919 percent.

Rotated sum of squared loadings along with the percentage of the variances suggest that the highest variance is of technology problem 14.622 which suggest that the technology problem is vital for the region in which the centre is located. Lowest is for operational problems which has low variance for the region in which the centre is located. The percentage of variance for the identified groups of problems suggests the differences and their accountability on the regions in which the centre is located.

### B. *Interpretation:*

This is the table that shows the output of the ANOVA analysis and whether we have a statistically significant difference between our group means. These results show the variance (Mean Square = "mean squared deviations from the mean" = variance) between groups and the variance within groups. When we divide the Mean Square (Between) by the Mean Square (Within) we get 4.0174. On Comparing this value to the F statistic (4.017) it is found to be very close, because that's what the F is - a ratio of the variance between groups to the variance within groups. A one-way ANOVA is used to test for category viz. rural, urban and tribal, in which the centre is located. The three categories differed significantly across the three sizes, $F$ (2, 77) = 4.017, $p$ = .022.

The arithmetic mean across the observation is 111.2143 for Urban, 83.4211 for Rural and 97.2857 for Tribal. The significant level is 0.022 (p= .022) which is below .05 and therefore, there is a statistically significant difference in total number of days of operation of the Centre are independent of the category viz. rural, urban and tribal, in which the Centre is located.

### C. *Interpretation:*

In the Anova table the results show the variance (Mean Square = "mean squared deviations from the mean" = variance) between groups and the variance within groups. When we divide the Mean Square (Between) by the Mean Square (Within) we get 7.599. On Comparing this value to the F statistic (7.599) it is found to be very close, because that's what the F is - a ratio of the variance between groups to the variance within groups.

A one-way ANOVA is used to test for category viz. rural, urban and tribal, in which the centre is located. The three categories differed significantly across the three sizes, $F$ (7, 72) =7.599, $p$ = .000.The mean value for the different regions is for Bhopal it is 119.1250, for Gwalior 106.7500, for Indore the mean value is 118.2000, for Jabalpur it is 106.5000, for Rewa 79.6667, for Sagar it is 44.3333, for Satna 117.7500, for Ujjain the mean value is 57.3333. The p value is 0.00



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which suggests that the value is less than .05 and hence the difference among the groups is significant.

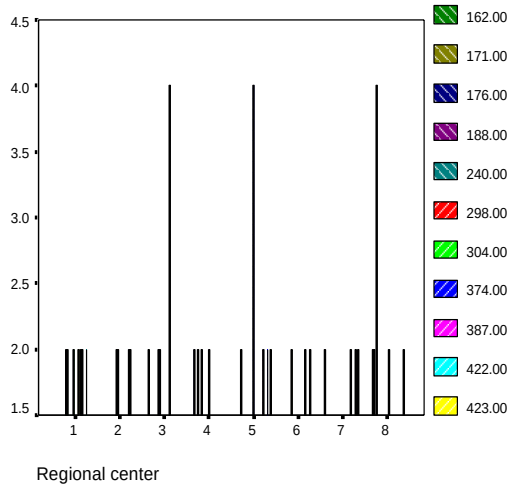
*D. Interpretation:*

[B] – y=bx+a Operations days=AVE (Problem mean) (.449) +79.506

According to the equation coefficient of AVE (problem mean) is .449, so for every unit increase AVE (problem mean) is .449 is increase in operation days.

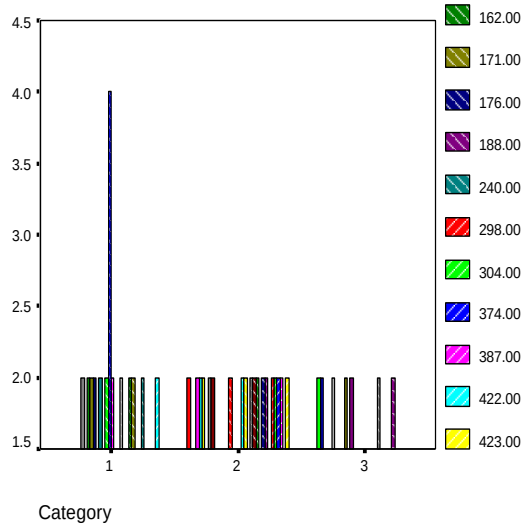
[T]- Value indicates statistical significance because it is .279 which is more than .05.The higher the t value, the greater the confidence we have in the coefficient we have in the coefficient as a predictor. Low t values are the indications of low reliability of the predictive power of that coefficient.

[P]-value is .781 indicates that it insignificantly predict the outcome variable because it is more than .05.




*E. Interpretation:*

This test shows that there is significant difference regarding the opinion of students enrolled for various courses of the region in which the centre is located (chi square = 501.667, p = .000).




*F. Interpretation:*

This test shows that there is significant difference in the opinion of students enrolled for various courses regarding the area viz. rural, urban and tribal, in which the Centre is located.(chi square = 125.865, p =.000).

## IV. Conclusion and Recommendations

The problems related to five basic factors – Technology Problem, System Problem, Infrastructure Problem, Resource Problem, Operational Problem - can give solutions to majority of the challenges, if properly dealt with.

On the basis of statistical analysis derived in 6.3 following conclusions and recommendations are drawn.

1. Factor analysis categorized problems faced by centres into five categories viz., technology problem, System problem, Infrastructure problem, Resource problem and Operational problem. These problems are lined in order of the extracted variance. In other words, the order of these extracted factors suggests their importance. Of the five problems, the technology problem's contribution as it is indicated by the variance, is highest. It is suggested to have a strong training program for the Centre coordinator on technological aspects. It is also recommended to appoint a technician who is only responsible for technical issues and should be periodically updated with the advancement in the technology. The maintenance of the equipments should be done on time and vendor should be made responsible through either AMC or through per site visit arrangement.

2. Two Anova tests conducted shows that the location of the centre affects the days of operation of the centre. First test was considered using categories viz., rural, urban and tribal, as independent variable. The outcome of this test suggests that the category affects days of operation of a centre. Second test where region was used as a dependent variable also favours its impact on days of operation. Additionally, it suggests that based on number of days of operation Sagar, Ujjain and Rewa belongs to a different cluster whereas Jabalpur, Gwalior, Satna, Indore and Bhopal belong to a separate cluster. The analysis shows that there may be region specific issues affecting the days of operation but broadly such issues may be divided into two or three cluster based on location of centre.

3. Statistical analysis based on hypothesis D clearly indicates difference in number of days of operation is not dependent on all the problems as discussed in point 1.

4. Statistical analysis based on hypothesis E and F shows that opinion of the students enrolled for the various courses is different for both i.e. region as well as category. It is, therefore, recommended that need based analysis is required to be conducted region wise and category wise. Further detailed study can taken up in this regard.

5. It is concluded that the problems are more or less similar irrespective of region in which center is located or category of the center. This enables to create a general policy decision for taking action for problems which are responsible for the failure. Strong monitoring and proper policy decisions can give better solution to all these challenges.



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**A: Nature of problems is independent of the region in which the centre is located.**

**Communalities**

| | Initial | Extraction |
|---|---|---|
| Low C/N (Carrier to Noise ratio) | 1.000 | .732 |
| Fault in UPS, Low input | 1.000 | .503 |
| Fault in CPU | 1.000 | .680 |
| Room shifting, improper maintenance and lay out of SIT room | 1.000 | .625 |
| Problem in LAN card | 1.000 | .936 |
| Shifting or de-alignment of antenna due to animal like monkey | 1.000 | .746 |
| SAT (Satellite Access Terminal) not stable | 1.000 | .628 |
| Power problem | 1.000 | .664 |
| Fault in RCST, LNB | 1.000 | .608 |
| Problem in cable connection | 1.000 | .790 |
| RCST is put off manually | 1.000 | .755 |
| Operator not available, or engaged in some other assignment | 1.000 | .618 |
| Fault in Camera | 1.000 | .935 |
| Non-availability of space as per prescribed lay-out of SIT | 1.000 | .621 |
| Improper logging | 1.000 | .807 |

Extraction Method: Principal Component Analysis.

| **Factor analysis result of impact of problems of the region in which the centre is located** | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| **FACTOR 1- Technology problem** | | | | | |
| Low C/N (Carrier to Noise ratio) | .732 | | | | |
| Problem in LAN card | .936 | | | | |
| SAT (Satellite Access Terminal) not stable | .628 | | | | |
| **FACTOR 2-System problem** | | | | | |
| Fault in UPS, Low input | | .503 | | | |
| Fault in CPU | | .680 | | | |
| Fault in Camera | | .935 | | | |
| **FACTOR 3-Infrastructure problem** | | | | | |
| Room shifting, improper maintenance and lay out of SIT room | | | .625 | | |
| Non-availability of space as per prescribed lay-out of SIT | | | .621 | | |
| Improper logging | | | .807 | | |



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| | | | | | |
|---|---|---|---|---|---|
| **FACTOR 4- Resource problem** | | | | | |
| Shifting or de-alignment of antenna due to animal like monkey | | | | .746 | |
| Operator not available, or engaged in some other assignment | | | | .618 | |
| **FACTOR 5-Operational problem** | | | | | |
| RCST is put off manually | | | | | .755 |
| Fault in RCST, LNB | | | | | .608 |
| Problem in cable connection | | | | | .790 |
| **% of variance** | 14.622 | 12.052 | 9.584 | 9.035 | 8.919 |

**Total Variance Explained**

| Component | Initial Eigen values | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2.607 | 17.380 | 17.380 | 2.607 | 17.380 | 17.380 | 2.193 | 14.622 | 14.622 |
| 2 | 1.932 | 12.879 | 30.259 | 1.932 | 12.879 | 30.259 | 1.808 | 12.052 | 26.673 |
| 3 | 1.350 | 9.001 | 39.260 | 1.350 | 9.001 | 39.260 | 1.438 | 9.584 | 36.257 |
| 4 | 1.299 | 8.660 | 47.919 | 1.299 | 8.660 | 47.919 | 1.355 | 9.035 | 45.292 |
| 5 | 1.248 | 8.317 | 56.236 | 1.248 | 8.317 | 56.236 | 1.338 | 8.919 | 54.212 |
| 6 | 1.129 | 7.528 | 63.764 | 1.129 | 7.528 | 63.764 | 1.300 | 8.664 | 62.875 |
| 7 | 1.084 | 7.224 | 70.988 | 1.084 | 7.224 | 70.988 | 1.217 | 8.113 | 70.988 |
| 8 | .902 | 6.011 | 76.999 | | | | | | |
| 9 | .789 | 5.258 | 82.257 | | | | | | |
| 10 | .728 | 4.857 | 87.114 | | | | | | |



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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 11 | .667 | 4.443 | 91.557 | | | | | | |
| 12 | .568 | 3.786 | 95.344 | | | | | | |
| 13 | .385 | 2.563 | 97.907 | | | | | | |
| 14 | .292 | 1.948 | 99.855 | | | | | | |
| 15 | .022 | .145 | 100.000 | | | | | | |

**B: Total number of days of operation of the centre is independent of the category viz. rural, urban and tribal, in which the centre is located.**

**Descriptive**

Operation days

| | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound | | |
| Urban | 28 | 111.2143 | 52.66270 | 9.95231 | 90.7938 | 131.6347 | .00 | 177.00 |
| Rural | 38 | 83.4211 | 32.25794 | 5.23293 | 72.8181 | 94.0240 | .00 | 131.00 |
| Tribal | 14 | 97.2857 | 22.24835 | 5.94612 | 84.4399 | 110.1315 | 63.00 | 119.00 |
| Total | 80 | 95.5750 | 40.92592 | 4.57566 | 86.4674 | 104.6826 | .00 | 177.00 |

**ANOVA**

Operation das

| | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 12502.715 | 2 | 6251.358 | 4.017 | .022 |
| Within Groups | 119816.835 | 77 | 1556.063 | | |
| Total | 132319.550 | 79 | | | |



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Post Hoc Tests

Multiple Comparisons

Operation days

Tukey HSD

| (I) Category | (J) Category | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |
| Urban | Rural | 27.79323* | 9.82460 | .016 | 4.3138 | 51.2727 |
| | Tribal | 13.92857 | 12.91205 | .530 | -16.9294 | 44.7866 |
| Rural | Urban | -27.79323* | 9.82460 | .016 | -51.2727 | -4.3138 |
| | Tribal | -13.86466 | 12.33274 | .502 | -43.3382 | 15.6089 |
| Tribal | Urban | -13.92857 | 12.91205 | .530 | -44.7866 | 16.9294 |
| | Rural | 13.86466 | 12.33274 | .502 | -15.6089 | 43.3382 |

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

Homogeneous Subsets

**Operation days**

TukeyHSD[a,,b]

| Category | N | Subset for alpha = 0.05 |
|---|---|---|
| | | 1 |
| Rural | 38 | 83.4211 |
| Tribal | 14 | 97.2857 |
| Urban | 28 | 111.2143 |
| Sig. | | .053 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.479.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.



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C: Total numbers of days of operation of the Centre are independent of the region in which the centre is located.

Operation days

| | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound | | |
| Bhopal | 16 | 119.1250 | 24.84854 | 6.21214 | 105.8841 | 132.3659 | 88.00 | 177.00 |
| Gwalior | 8 | 106.7500 | 36.66353 | 12.96251 | 76.0985 | 137.4015 | 49.00 | 134.00 |
| Indore | 10 | 118.2000 | 24.32557 | 7.69242 | 100.7985 | 135.6015 | 87.00 | 158.00 |
| Jabalpur | 8 | 106.5000 | 36.20971 | 12.80206 | 76.2279 | 136.7721 | 63.00 | 158.00 |
| Rewa | 12 | 79.6667 | 18.52435 | 5.34752 | 67.8969 | 91.4365 | 47.00 | 100.00 |
| Sagar | 6 | 44.3333 | 33.86247 | 13.82429 | 8.7969 | 79.8698 | 1.00 | 71.00 |
| Satna | 8 | 117.7500 | 26.14656 | 9.24421 | 95.8909 | 139.6091 | 92.00 | 158.00 |
| Ujjain | 12 | 57.3333 | 51.01753 | 14.72749 | 24.9183 | 89.7483 | .00 | 134.00 |
| Total | 80 | 95.5750 | 40.92592 | 4.57566 | 86.4674 | 104.6826 | .00 | 177.00 |

**ANOVA**

Operation days

| | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 56220.533 | 7 | 8031.505 | 7.599 | .000 |
| Within Groups | 76099.017 | 72 | 1056.931 | | |
| Total | 132319.550 | 79 | | | |

**Post Hoc Tests**

**Multiple Comparisons**

Operation days
Tukey HSD

| (I) Regional center | (J) Regional center | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |



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| | | | | | | |
|---|---|---|---|---|---|---|
| Bhopal | Gwalior | 12.37500 | 14.07745 | .987 | -31.5721 | 56.3221 |
| | Indore | .92500 | 13.10539 | 1.000 | -39.9875 | 41.8375 |
| | Jabalpur | 12.62500 | 14.07745 | .985 | -31.3221 | 56.5721 |
| | Rewa | 39.45833* | 12.41514 | .043 | .7006 | 78.2160 |
| | Sagar | 74.79167* | 15.56320 | .000 | 26.2063 | 123.3770 |
| | Satna | 1.37500 | 14.07745 | 1.000 | -42.5721 | 45.3221 |
| | Ujjain | 61.79167* | 12.41514 | .000 | 23.0340 | 100.5494 |
| Gwalior | Bhopal | -12.37500 | 14.07745 | .987 | -56.3221 | 31.5721 |
| | Indore | -11.45000 | 15.42107 | .995 | -59.5916 | 36.6916 |
| | Jabalpur | .25000 | 16.25524 | 1.000 | -50.4957 | 50.9957 |
| | Rewa | 27.08333 | 14.83893 | .605 | -19.2410 | 73.4076 |
| | Sagar | 62.41667* | 17.55766 | .015 | 7.6050 | 117.2283 |
| | Satna | -11.00000 | 16.25524 | .997 | -61.7457 | 39.7457 |
| | Ujjain | 49.41667* | 14.83893 | .028 | 3.0924 | 95.7410 |
| Indore | Bhopal | -.92500 | 13.10539 | 1.000 | -41.8375 | 39.9875 |
| | Gwalior | 11.45000 | 15.42107 | .995 | -36.6916 | 59.5916 |
| | Jabalpur | 11.70000 | 15.42107 | .995 | -36.4416 | 59.8416 |
| | Rewa | 38.53333 | 13.92015 | .120 | -4.9227 | 81.9894 |
| | Sagar | 73.86667* | 16.78834 | .001 | 21.4567 | 126.2766 |
| | Satna | .45000 | 15.42107 | 1.000 | -47.6916 | 48.5916 |
| | Ujjain | 60.86667* | 13.92015 | .001 | 17.4106 | 104.3227 |
| Jabalpur | Bhopal | -12.62500 | 14.07745 | .985 | -56.5721 | 31.3221 |
| | Gwalior | -.25000 | 16.25524 | 1.000 | -50.9957 | 50.4957 |
| | Indore | -11.70000 | 15.42107 | .995 | -59.8416 | 36.4416 |
| | Rewa | 26.83333 | 14.83893 | .617 | -19.4910 | 73.1576 |
| | Sagar | 62.16667* | 17.55766 | .015 | 7.3550 | 116.9783 |
| | Satna | -11.25000 | 16.25524 | .997 | -61.9957 | 39.4957 |
| | Ujjain | 49.16667* | 14.83893 | .030 | 2.8424 | 95.4910 |
| Rewa | Bhopal | -39.45833* | 12.41514 | .043 | -78.2160 | -.7006 |
| | Gwalior | -27.08333 | 14.83893 | .605 | -73.4076 | 19.2410 |
| | Indore | -38.53333 | 13.92015 | .120 | -81.9894 | 4.9227 |
| | Jabalpur | -26.83333 | 14.83893 | .617 | -73.1576 | 19.4910 |
| | Sagar | 35.33333 | 16.25524 | .380 | -15.4124 | 86.0791 |
| | Satna | -38.08333 | 14.83893 | .186 | -84.4076 | 8.2410 |
| | Ujjain | 22.33333 | 13.27234 | .698 | -19.1004 | 63.7671 |
| Sagar | Bhopal | -74.79167* | 15.56320 | .000 | -123.3770 | -26.2063 |
| | Gwalior | -62.41667* | 17.55766 | .015 | -117.2283 | -7.6050 |
| | Indore | -73.86667* | 16.78834 | .001 | -126.2766 | -21.4567 |
| | Jabalpur | -62.16667* | 17.55766 | .015 | -116.9783 | -7.3550 |
| | Rewa | -35.33333 | 16.25524 | .380 | -86.0791 | 15.4124 |
| | Satna | -73.41667* | 17.55766 | .002 | -128.2283 | -18.6050 |
| | Ujjain | -13.00000 | 16.25524 | .993 | -63.7457 | 37.7457 |
| Satna | Bhopal | -1.37500 | 14.07745 | 1.000 | -45.3221 | 42.5721 |
| | Gwalior | 11.00000 | 16.25524 | .997 | -39.7457 | 61.7457 |



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| | | | | | | |
|---|---|---|---|---|---|---|
| | Indore | -.45000 | 15.42107 | 1.000 | -48.5916 | 47.6916 |
| | Jabalpur | 11.25000 | 16.25524 | .997 | -39.4957 | 61.9957 |
| | Rewa | 38.08333 | 14.83893 | .186 | -8.2410 | 84.4076 |
| | Sagar | 73.41667* | 17.55766 | .002 | 18.6050 | 128.2283 |
| | Ujjain | 60.41667* | 14.83893 | .003 | 14.0924 | 106.7410 |
| Ujjain | Bhopal | -61.79167* | 12.41514 | .000 | -100.5494 | -23.0340 |
| | Gwalior | -49.41667* | 14.83893 | .028 | -95.7410 | -3.0924 |
| | Indore | -60.86667* | 13.92015 | .001 | -104.3227 | -17.4106 |
| | Jabalpur | -49.16667* | 14.83893 | .030 | -95.4910 | -2.8424 |
| | Rewa | -22.33333 | 13.27234 | .698 | -63.7671 | 19.1004 |
| | Sagar | 13.00000 | 16.25524 | .993 | -37.7457 | 63.7457 |
| | Satna | -60.41667* | 14.83893 | .003 | -106.7410 | -14.0924 |

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

**Homogeneous Subsets**

**Operation days**

TukeyHSD[a,,b]

| | | Subset for alpha = 0.05 | |
|---|---|---|---|
| Regional center | N | 1 | 2 |
| Sagar | 6 | 44.3333 | |
| Ujjain | 12 | 57.3333 | |
| Rewa | 12 | 79.6667 | 79.6667 |
| Jabalpur | 8 | | 106.5000 |
| Gwalior | 8 | | 106.7500 |
| Satna | 8 | | 117.7500 |
| Indore | 10 | | 118.2000 |
| Bhopal | 16 | | 119.1250 |
| Sig. | | .293 | .173 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 9.187.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.



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**D: There is an impact of problems on the total no. of days of operation.**
**Model Summary (b)**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .032(a) | .001 | -.012 | 41.16690 |

a Predictors: (Constant), AVE
b Dependent Variable: Operation days

ANOVA (b)

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 131.897 | 1 | 131.897 | .078 | .781(a) |
| | Residual | 132187.653 | 78 | 1694.713 | | |
| | Total | 132319.550 | 79 | | | |

a Predictors: (Constant), AVE
b Dependent Variable: Operation days

Coefficients (a)

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 79.506 | 57.785 | | 1.376 | .173 |
| | AVE | .449 | 1.608 | .032 | .279 | .781 |

a Dependent Variable: Operation days

**E: There is no significant difference in the opinion of students enrolled for various courses regarding the region in which the centre is located.**

Crosstabs

Case Processing Summary

| | Cases | | | | | |
|---|---|---|---|---|---|---|
| | Valid | | Missing | | Total | |
| | N | Percent | N | Percent | N | Percent |
| Regional center * student total | 80 | 77.7% | 23 | 22.3% | 103 | 100.0% |

Chi-Square Tests

| | Value | Df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 501.667(a) | 231 | .000 |
| Likelihood Ratio | 309.124 | 231 | .000 |
| Linear-by-Linear Association | 1.982 | 1 | .159 |
| N of Valid Cases | 80 | | |

a 272 cells (100.0%) have expected count less than 5. The minimum expected count is .15.



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**F: There is no significant difference in the opinion of students enrolled for various courses regarding the area viz. rural, urban and tribal, in which the centre is located.**

**Case Processing Summary**

| | Cases | | | | | |
|---|---|---|---|---|---|---|
| | Valid | | Missing | | Total | |
| | N | Percent | N | Percent | N | Percent |
| Category * student total | 80 | 77.7% | 23 | 22.3% | 103 | 100.0% |

**Chi-Square Tests**

| | Value | Df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 125.865(a) | 66 | .000 |
| Likelihood Ratio | 136.445 | 66 | .000 |
| Linear-by-Linear Association | .266 | 1 | .606 |
| N of Valid Cases | 80 | | |

a 102 cells (100.0%) have expected count less than 5. The minimum expected count is .35.

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