CHAPTER V

ANALYSIS AND INTERPRETATION OF DATA
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References
CHAPTER V

Analysis and Interpretation of Data

Methods are the means through which the goal of education can be realised. Teaching methods have been based either upon the nature of the subject matter, the psychology of the learning process or merely on the ways of presenting lesson materials to attract the interest and hold the attention of the pupils. Teaching pupils with active methods of teaching is a way to take up the challenge of motivating pupils.

The main aim of teaching is to bring about socially desirable changes in pupils and these can be achieved only if the teaching is effective and based on the principles of teaching. How the pupil should learn depends on the method, the teacher adopts. Teaching-learning is a complex process involving teachers, students, instructional and illustrative materials and the congenial atmosphere in the classroom.

5.1 Methods of Teaching Adopted by Teacher Educators

There are number of methods of teaching adopted by teacher educators in the institutions of teacher education. A survey has been conducted to find the prevalence of various teaching methods in the teacher education institutions. Table 5.1 presents the distribution of various teaching methods adopted by teacher educators at present.
Table 5.1
Teaching Methods Adopted by Teacher Educators at Present in the Institutions of Teacher Education

<table>
<thead>
<tr>
<th>SI No.</th>
<th>Teaching Methods</th>
<th>Teachers adopted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
</tr>
<tr>
<td>1</td>
<td>Lecture Method</td>
<td>375</td>
</tr>
<tr>
<td>2</td>
<td>Discussion Method</td>
<td>334</td>
</tr>
<tr>
<td>3</td>
<td>Demonstration Method</td>
<td>301</td>
</tr>
<tr>
<td>4</td>
<td>Project Method</td>
<td>102</td>
</tr>
</tbody>
</table>

Most prevalent method of teaching adopted by teacher educators is Lecture Method. According to Verner and Dickinson\(^1\) (1968) lecturing is defined as an “instructional technique through which an agent presents an oral discourses on a particular subject”. The purpose of lecturing is to give information, generate understanding and create interest suggests Brown\(^2\) (1978). But, the lecture method has a number of shortcomings. Individual attention to students is hardly feasible. It is not suitable for developing skills, inculcating values, shaping attitudes, etc.

Discussion is the other most favoured method of the teacher educators at the undergraduate level of teacher education. Demonstration and Project methods are also preferred by teacher educators. At the same time Modular, Mastery, Heuristic, Individual Laboratory method, panel discussion and brainstorming are not at all used by any of the teacher educators.
Most of the teachers opined that the lack of facilities (81.0%) was the greatest difficulty for using the modern methods for teaching. So, teachers concentrate on traditional method of teaching, namely lecture method.

The lowest percentage of teacher educators who reported difficulties in adopting various modern methods of teaching is 70 percent which is on lack of training. This percentage is subjected to z test concerning the proportion in a population of 50 percent. The z value is found to be 8 which is very much higher than 1.96. So, it can be concluded that the difficulty in adopting various modern methods of teaching are felt to majority of teacher educators.

5.1.1 Opinion of teacher educators on adequacy of facilities.

According to Yadav\(^3\) (1999) a class room with sufficient teaching learning material create healthy environment for teaching process. It is evident that better class room situation motivate the student to participate actively in teaching-learning process.
Teacher Educators opinion of the adequacy of academic facilities was collected through a questionnaire prepared for the purpose.

5.1.2 Library.

One of the most important infrastructure facilities essential for an educational institution is library. The library in an institution is important both in knowledge acquisition and value development of students. It supplements classroom instruction by teachers which is the dominant method of teaching in education institutions.

This part deals with the opinion of teacher educators on the facilities of library and their suggestions for better functioning of libraries. Regarding the objectives of library, teacher educators were requested to rank the given eleven objectives from 1 to 11. Using the frequency of responses objectives were ranked and presented in Table 5.3.

The highest proportion of teacher educators think that the all round development of personality is the main objective of the library. Broadening of interest and educating the working groups are the other major objectives mentioned by high proportion of teacher educators.
Table 5.3
Ranks given by Teacher Educators to the Objectives of the Library

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Item</th>
<th>Rank</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>All round development of Personality</td>
<td>1</td>
<td>342</td>
</tr>
<tr>
<td>2</td>
<td>Broadening of interest</td>
<td>2</td>
<td>340</td>
</tr>
<tr>
<td>3</td>
<td>Educating the working groups</td>
<td>3</td>
<td>338</td>
</tr>
<tr>
<td>4</td>
<td>Source of inspiration</td>
<td>4</td>
<td>332</td>
</tr>
<tr>
<td>5</td>
<td>Training in proper use of books</td>
<td>5</td>
<td>330</td>
</tr>
<tr>
<td>6</td>
<td>Escape from boredom or worry</td>
<td>6</td>
<td>327</td>
</tr>
<tr>
<td>7</td>
<td>Development of study habits</td>
<td>7</td>
<td>322</td>
</tr>
<tr>
<td>8</td>
<td>Promotion of self learning</td>
<td>8</td>
<td>320</td>
</tr>
<tr>
<td>9</td>
<td>Richness of information</td>
<td>9</td>
<td>316</td>
</tr>
<tr>
<td>10</td>
<td>Leisure time hobby</td>
<td>10</td>
<td>314</td>
</tr>
<tr>
<td>11</td>
<td>To encourage reading habit</td>
<td>11</td>
<td>301</td>
</tr>
</tbody>
</table>

For the item 'Systems recommended to run libraries', 75 percent of the teacher educators pointed out that a central library, with subjective classification is advisable, while 17 percent of teacher educators suggested class library with subject wise classification. For 'library administration' 62 percent of the teacher educators suggested a separate wing in the D.C.E's office, 23 percent of the teacher educators supported library administration by Government.

More than 50 percent of the teacher educators pointed out that a short term library course should be given to teachers as part of in-service training.
39 percent of the teacher educators suggested this should be done as part of the B.Ed. course and the rest were against the idea of giving teachers a short term library course.

Table 5.4
Ranks Given by Teacher Educators on Common Defects found in Library Administration and Organisation

<table>
<thead>
<tr>
<th>SI No</th>
<th>Item</th>
<th>Rank</th>
<th>Response No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Improper book selection methods</td>
<td>1</td>
<td>340</td>
<td>85.00</td>
</tr>
<tr>
<td>2</td>
<td>Latest reference books not available</td>
<td>2</td>
<td>333</td>
<td>83.25</td>
</tr>
<tr>
<td>3</td>
<td>Absence of adequate number of staff</td>
<td>3</td>
<td>331</td>
<td>82.75</td>
</tr>
<tr>
<td>4</td>
<td>No library committee</td>
<td>4</td>
<td>329</td>
<td>82.25</td>
</tr>
<tr>
<td>5</td>
<td>Finance not adequate</td>
<td>5</td>
<td>322</td>
<td>80.50</td>
</tr>
<tr>
<td>6</td>
<td>Books are not classified &amp; catalogued</td>
<td>6</td>
<td>319</td>
<td>79.75</td>
</tr>
<tr>
<td>7</td>
<td>Lack of library orientation classes</td>
<td>7</td>
<td>317</td>
<td>79.25</td>
</tr>
<tr>
<td>8</td>
<td>Reading room not available</td>
<td>8</td>
<td>313</td>
<td>78.25</td>
</tr>
<tr>
<td>9</td>
<td>Closed shelf system</td>
<td>9</td>
<td>311</td>
<td>77.75</td>
</tr>
</tbody>
</table>

Defects usually seen in library administration were given in the questionnaire and the teacher educators were requested to rank from 1-9. The defects were finally ranked using the frequency of responses (Table 5.4)
For improving the efficiency of the functioning of libraries, a number of proposals were given in the questionnaire and the teacher educators were asked to rank them from 1-12. Based on the frequency of responses, the defects were ranked from 1-12 in Table 5.5.

5.1.3 **Laboratory facilities.**

Opinion of teacher educators on the existing laboratory facilities were collected through this part. Eight percent of the teacher educators were of the opinion that the location of laboratory is not comfortable. The area of...
laboratory and number of students at a time were pointed out as inadequate by percent and percent of teacher educators respectively.

**Table 5.6**

**Ranks Given by Teacher Educators on the Existing of Laboratory Facilities**

<table>
<thead>
<tr>
<th>SI No</th>
<th>Item</th>
<th>Rank</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Location of laboratory</td>
<td>1</td>
<td>320</td>
</tr>
<tr>
<td>2</td>
<td>Number of students at a time</td>
<td>2</td>
<td>310</td>
</tr>
<tr>
<td>3</td>
<td>Area</td>
<td>3</td>
<td>300</td>
</tr>
<tr>
<td>4</td>
<td>Furniture, equipment, apparatus</td>
<td>4</td>
<td>298</td>
</tr>
<tr>
<td>5</td>
<td>Stock facilities</td>
<td>5</td>
<td>290</td>
</tr>
<tr>
<td>6</td>
<td>Replacement and repair provisions</td>
<td>6</td>
<td>280</td>
</tr>
</tbody>
</table>

Furniture, equipments, apparatus and chemicals were found inadequate by 74.5 percent of teacher educators. Stock facilities by 72.5 percent, replacement and repair provisions were shown as inadequate by 70.00 percent of teacher educators. A summary of this data are shown in Table 5.6.

The lowest percentage of teacher educators who opined the inadequacy of laboratory facilities is 70.00 percent which is on replacement and repair provisions. This percentage is subjected to z test concerning the proportion in a population of 50 percent. The z value is found to be 8, which
is very much higher than 1.96. So it can be concluded that the inadequacy of laboratory facilities is felt to majority of teacher educators.

5.1.3.1 **Additional requirements suggested by teacher educators for laboratory**

The educators were requested to write their additional requirements for the proper functioning of the laboratory in their respective institution. The requirements are listed as follows

**Table 5.7**  
**Ranks given by Teacher Educators on Additional Requirements for Laboratory**

<table>
<thead>
<tr>
<th>SI No</th>
<th>Item</th>
<th>Rank</th>
<th>Response No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Separate room for laboratory</td>
<td>1</td>
<td>310</td>
<td>77.50</td>
</tr>
<tr>
<td>2</td>
<td>Furniture</td>
<td>2</td>
<td>295</td>
<td>73.75</td>
</tr>
<tr>
<td>3</td>
<td>Adequate number of equipments</td>
<td>3</td>
<td>290</td>
<td>72.50</td>
</tr>
<tr>
<td>4</td>
<td>Sufficient number of apparatus</td>
<td>4</td>
<td>285</td>
<td>71.25</td>
</tr>
<tr>
<td>5</td>
<td>Supply of chemicals</td>
<td>5</td>
<td>280</td>
<td>70.00</td>
</tr>
<tr>
<td>6</td>
<td>Storage facilities</td>
<td>6</td>
<td>279</td>
<td>69.75</td>
</tr>
<tr>
<td>7</td>
<td>Funds for replacement and repair</td>
<td>7</td>
<td>275</td>
<td>68.75</td>
</tr>
</tbody>
</table>

5.1.3.2 **Difficulties in using laboratory**

Teacher educators were requested to write the difficulties experienced by them for proper use of laboratory. The difficulties as pointed out by teacher educators were:
Table 5.8
Ranks Given by Teacher Educators on the Inadequacy of Laboratory Facilities

<table>
<thead>
<tr>
<th>S/No</th>
<th>Item</th>
<th>Rank</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lack of adequate space</td>
<td>1</td>
<td>330</td>
</tr>
<tr>
<td>2</td>
<td>Lack of furniture</td>
<td>2</td>
<td>320</td>
</tr>
<tr>
<td>3</td>
<td>Lack of laboratory assistant</td>
<td>3</td>
<td>316</td>
</tr>
<tr>
<td>4</td>
<td>Lack of water and electricity</td>
<td>4</td>
<td>315</td>
</tr>
<tr>
<td>5</td>
<td>Lack of time</td>
<td>5</td>
<td>310</td>
</tr>
</tbody>
</table>

The lowest percentage of teacher educators who opined the inadequacy of laboratory facilities is 77.50 percent which is on lack of time. This percentage is subjected to z test concerning the proportion in the population of 50 percent. The z value is found to be 11 which is very much higher than 1.96. So it can be concluded that the inadequacy of laboratory facilities is felt to majority of teacher educators.

5.1.4 Audio-visual aids.

Opinion of teacher educators on the audio-visual aids and facilities were collected through this part Teacher educators were requested to give their opinion on the facilities for audio-visual aids was shown by 95 percent of the teacher educators as the main problem 80 percent of the teacher educators were of the opinion that improved aids are insufficient, student-teacher made aids are insufficient in the opinion of 82 percent of teacher
educators, while 18 percent disagree with this opinion. College input for audio-visual aids were shown as totally inadequate by 91 percent of teacher educators. 93 percent of teacher educator's marked storage as well as replacement and repair provisions as inadequate. Details are presented in Table 5.9.

Table 5.9
Ranks Given by Teacher Educators on the Inadequacy of Audio-visual Aids

<table>
<thead>
<tr>
<th>SI No</th>
<th>Item</th>
<th>Rank</th>
<th>Response No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of Audio-visual aids</td>
<td>1</td>
<td>380</td>
<td>95.00</td>
</tr>
<tr>
<td>2</td>
<td>Replacement and repair provisions</td>
<td>2</td>
<td>372</td>
<td>93.00</td>
</tr>
<tr>
<td>3</td>
<td>Storage facilities</td>
<td>3</td>
<td>364</td>
<td>91.00</td>
</tr>
<tr>
<td>4</td>
<td>College input</td>
<td>4</td>
<td>360</td>
<td>90.00</td>
</tr>
<tr>
<td>5</td>
<td>Student teacher made aids</td>
<td>5</td>
<td>328</td>
<td>82.00</td>
</tr>
<tr>
<td>6</td>
<td>Teacher improvised aids</td>
<td>6</td>
<td>320</td>
<td>80.00</td>
</tr>
</tbody>
</table>

The lowest percentage of teacher educators who opined the inadequacy of audio-visual aids is 80.00 percent which is on teacher improvised aids. This percentage is subjected to z test concerning the proportion in a population of 50 percent. The z value is found to be 12, which is very much higher than 1.96. So it can be concluded that the inadequacy of audio-visual aids is felt to majority of teacher educators.
Teacher educators were requested to give their additional requirements for the proper use of audio-visual aids. Their requirements are listed in Table 5.10.

### Table 5.10
**Ranks Given by Teacher Educators on the Additional Requirements of Audio-visual Aids**

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Item</th>
<th>Rank</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Separate Audio-Visual room</td>
<td>1</td>
<td>329</td>
</tr>
<tr>
<td>2</td>
<td>Audio-Visual aids</td>
<td>2</td>
<td>326</td>
</tr>
<tr>
<td>3</td>
<td>Funds</td>
<td>3</td>
<td>325</td>
</tr>
<tr>
<td>4</td>
<td>Books and audio-Visual aids</td>
<td>4</td>
<td>320</td>
</tr>
<tr>
<td>5</td>
<td>Instructor or trained teacher</td>
<td>5</td>
<td>319</td>
</tr>
<tr>
<td>6</td>
<td>Extra period</td>
<td>6</td>
<td>310</td>
</tr>
</tbody>
</table>

Results of survey on the physical and academic facilities of Teacher Education institutions along with the opinion of 400 teacher educators of the fifty teacher education institutions showed that the present physical and academic facilities in the Teacher Education institutions are inadequate especially for the feasibility of implementing modern instructional strategies.

### 5.2 Awareness of Teacher Educators on Modular Learning Strategy

The awareness of teacher educators on Modular Learning strategy is collected through the Modular Awareness Questionnaire. There were 40 items in the questionnaire. The statements were positive and negative and the scoring scheme was that for each positive statements scores were assigned 3,2,1 and for negative statements scores in the reverse order 1,2,3.
The Maximum score is 120 and the minimum score is 40. The average score of total teacher educators is 97.89 (SD = 10.74).

5.2.1 **Difference in the awareness of teacher educators on Modular Learning strategy.**

The average score of male teacher educators on Modular Learning Strategy is 109.85 with a standard deviation of 5.26 and those of female teacher educators is 90.70 with a standard deviation of 5.43. The significance of difference between mean scores of male and female teacher educators is tested with t statistics. The t value (34.55) indicates that the awareness of male and female teacher educators on Modular Learning strategy is significantly different.

**Table 5.11**
Comparison of Mean Score of Awareness of Teacher Educators on Modular Learning Strategy in Different Sub samples

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>109.85</td>
<td>5.26</td>
<td>152</td>
<td>34.55*</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Female</td>
<td>90.70</td>
<td>5.43</td>
<td>248</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Locality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>102.83</td>
<td>10.46</td>
<td>247</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>90.14</td>
<td>5.05</td>
<td>153</td>
<td>14.00*</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Govt.</td>
<td>89.76</td>
<td>5.24</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pvt.</td>
<td>98.69</td>
<td>10.80</td>
<td>368</td>
<td>4.62*</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

**significant at 1 percent level**

Similarly, the mean scores of teacher educators from urban institutions is significantly different from those of rural institutions by a difference of about 13. The awareness score of teacher educators from private institutions is
98.69, which is about 8 points higher than that of teacher educators from the Government institutions. From the results it can be seen that male teacher educators, teacher educators from urban as well as private institutions have higher awareness on Modular learning strategy.

5.3 **Awareness of Teacher Educators on Mastery Learning Strategy**

The awareness of teacher educators on Mastery Learning strategy is collected through the Mastery Learning Awareness Questionnaire. The valuation procedure is the same as that of Modular Learning awareness. The average score of total teacher educators is 89.15 (SD = 8.19).

5.3.1 **Difference in the awareness of teacher educators on Mastery Learning strategy.**

The average score of male teacher educators on Mastery Learning Strategy is 96.25 with a standard deviation of 6.24 and those of female teacher educators is 85.41 with a standard deviation of 6.89. The significance of difference between mean scores of male and female teacher educators is tested with t statistics. The t value (14.33) indicates that the awareness of male and female teacher educators on Mastery Learning strategy is significantly different.
Table 5.12
Comparison of Mean Score of Awareness of Teacher Educators on Mastery Learning Strategy in Different Sub samples

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>95.25</td>
<td>6.24</td>
<td>152</td>
<td>14.33**</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Female</td>
<td>85.41</td>
<td>6.89</td>
<td>248</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Locality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>91.47</td>
<td>8.16</td>
<td>247</td>
<td>7.69**</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Rural</td>
<td>85.40</td>
<td>6.73</td>
<td>153</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Govt.</td>
<td>84.97</td>
<td>6.30</td>
<td>32</td>
<td>3.03**</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Pvt.</td>
<td>89.51</td>
<td>8.24</td>
<td>368</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**significant at 1 percent level

Similarly, the mean scores of teacher educators from urban institutions is significantly different from those of rural institutions by a difference of more than 6. The awareness score of teacher educators from private institutions is 89.51, which is about 5 points higher than that of teacher educators from the Government institutions. From the results it can be seen that male teacher educators, teacher educators from urban as well as private institutions have higher awareness on Mastery learning strategy.

5.4 Attitude of Teacher Educators Towards Modern Instructional Strategies

According to Sukhia and Mehrotra\(^4\) (1974) attitude denotes the inner feeling or belief of a person towards a particular phenomenon. Behari and Sen\(^5\) (1998) has found that teachers attitude towards the teaching role has a direct relation with students cognitive development. Teachers' attitude
towards teaching role should be flexible and they should adopt individualized, innovative teaching behaviour.

The attitudes of teacher educators towards modern instructional strategies were studied through a Scale of Attitude towards Modern Instructional Strategies (SATMIS). Initially there were 35 statements randomly arranged regarding the eleven Modern Instructional Strategies. After item selection process, 30 statements were retained. The responses are scored in five-point scale.

The average score of total teachers is 96.52 with a standard deviation of 9.46

5.4.1 Difference in the attitude of teacher educators based on gender.

The average score of male teacher educators is 90.55 with a standard deviation of 7.56 and those of female teacher educators is 100.17 with a standard deviation of 8.63 The significance of difference between means is calculated by t statistics.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>90.55</td>
<td>7.56</td>
<td>152</td>
<td>11.31*</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Female</td>
<td>100.17</td>
<td>8.63</td>
<td>248</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**significant at 1 percent level
The t statistics indicates that attitude of male teacher educators and female teacher educators are significantly different. Same result can be seen in many studies. Good and Sikes and Brophy\(^6\) (1973) found difference in the attitudes scores of male and female teacher educators.

5.4.2 **Difference in the attitude of teacher educators of urban and rural institutions**

When the sample of teacher educators was divided into two according to the place of their institutions, the average attitude score was found to be higher among the teacher educators from urban institutions (102.11) than those from rural institutions (87.49). The result of t-test showed that the difference in the attitude scores of teacher educators from urban and rural institutions is highly significant.

Table 5.14
Comparison of Mean Attitude Scores of Teacher Educators from Urban and Rural Institutions on SATMIS

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>102.11</td>
<td>6.77</td>
<td>247</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>87.49</td>
<td>5.28</td>
<td>153</td>
<td>22.72**</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

*\(\text{** significant at 1 percent level}\)*
5.4.3 **Difference in the attitude of teacher educators of government and private institutions.**

The attitude score of teacher educators from private institution is about 14 points higher than that of the teacher educators from the Government institutions.

When the attitude scores of teacher educators from the Government and private institutions are compared using t statistics, the value of t is found to be 8.33. The t value is significant at 1 percent level of significance. Hence, the difference between the mean attitude scores of teacher educators from the Government and private institutions are substantially different.

**Table 5.15**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>84.15</td>
<td>7.02</td>
<td>32</td>
<td>8.33**</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Private</td>
<td>97.59</td>
<td>8.87</td>
<td>368</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**significant at 1 percent level**

5.5 **Effectiveness of Modular and Mastery Learning Strategies**

According to Cropley and Dave (1978), the duties of a teacher traditionally were imparting knowledge, keeping order and judging outcomes. With pervasive changes taking place at every nook and corner of the world, conception of the roles of a teacher is changing rapidly. Skills and knowledge that are thought to be great assets in the hands of students are facing the
threat of obsolescence. Old theories and skills are replaced by new ones at such a rapid rate, that everything seems to be in a state of flux. Hence, the need for more effective and efficient strategies of learning techniques is the vital need of present educational system. Under these circumstances, exploring the effectiveness of Modular and Mastery learning strategies is of much importance.

In order to study the effectiveness of Modular and Mastery learning strategies, a sample of 240 teacher trainees from four institutions of teacher education was taken by random sampling method.

The samples from each institution were further divided into two: experimental groups and control groups by keeping the proportion of males and females. One experimental group was to study the effectiveness of Modular Learning and the other experimental group was for studying the effectiveness of Mastery Learning Strategy. So ultimately the sample consisted of 160 students in experimental group and 80 students in the control group.

Since the sampling design selected for the study was post test only control group design maximum care was taken in selecting identical samples for experimental and control groups.

5.5.1 Matching of experimental and control groups.

The impact of socio-economic status on the academic achievement of students cannot be underestimated. Baker (1961) controlled Socio-economic status of children while studying the influence of mental ability on academic
achievement of students. Hence, the equality of experimental and control groups are ensured with respect to the Socio-economic status of teacher trainees and their academic achievement.

5.5.1.1 Socio-economic status

The Socio-economic status of the teacher trainees was measured in terms of their parental occupation, parental education and parental income. The Socio-economic scale formulated by Nair\textsuperscript{9} (1970) with necessary modification in scoring was used to find out the Socio-economic score of teacher trainees. The value of the score ranged from a maximum of 30 to a minimum of 2.

The arithmetic mean of Socio-economic score for the total sample was found to be 20.86 with a standard deviation of 5.32. The score of the total sample ranged from a maximum of 30 to a minimum of 2. The Socio-economic score has a skewness of -0.08. The statistical parameters of the Socio-economic score indicate that the sample of teacher trainees are from a diverse Socio-economic status with a higher proportion in middle and upper middle social class.

5.5.1.1.1 Socio-economic status of teacher trainees from government and private institutions

When the sample of teacher trainees was divided into two according to the management of their institutions, the average Socio-economic score was found to be slightly higher among the trainees from Government institutions (25.15) than those from private institutions (24.97). But the result of t-test
showed that the difference in the Socio-economic scores of teacher trainees from Government and Private institutions are not statistically significant.

Table 5.16
Comparison of Mean of the Socio-economic Scores of Teacher Trainees from Government and Private Institutions.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No.</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>25.18</td>
<td>5.24</td>
<td>120</td>
<td>0.73</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Private</td>
<td>24.77</td>
<td>3.14</td>
<td>120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

So, as far as the Socio-economic status of teacher trainees is concerned, there is no significant difference with regard to the management of the institutions where they are studying.

5.5.1.1.2 Socio-economic status of male and female teacher trainees

The result of t-test given in Table 5.2 shows that even though the female trainees have a little higher Socio-economic score as compared to that of male trainees, the difference is not statistically significant.

Table 5.17
Comparison of Mean of the Socio-economic Scores of Male and Female Teacher Trainees

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No.</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>25.15</td>
<td>6.97</td>
<td>120</td>
<td>0.67</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Female</td>
<td>24.68</td>
<td>3.23</td>
<td>120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
It means that with regard to the gender of teacher trainees, there is no significant difference in their Socio-economic status. The male and female teacher trainees belong to families of similar Socio-economic status.

5.5.1.1.3 **Socio-economic status of teacher trainees from urban and rural institutions.**

The institutions are divided into two groups according to the place where they are situated. The sample consists of equal number of teacher trainees from urban institutions and rural Institutions. The average Socio-economic scores of teacher trainees from urban institutions is found to be slightly higher (28.03) than that of teacher trainees from rural institutions (21.80). Table 5.18 shows the mean scores and test of significance of their difference.

**Table 5.18**

*Comparison of Mean of the Socio-economic Scores of Teacher Trainees from Urban and Rural Institutions*

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>28.03</td>
<td>3.86</td>
<td>120</td>
<td>10.81</td>
<td>0.01</td>
</tr>
<tr>
<td>Rural</td>
<td>21.80</td>
<td>4.96</td>
<td>120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The result of t-test shows that the difference in the Socio-economic scores of teacher trainees from urban and rural institutions is statistically significant. The average Socio-economic score of teacher trainees from urban institutions is found to be higher than that of teacher trainees from rural
institutions by more than six points. It means that Socio-economic status of teacher trainees from urban institutions is substantially higher than that of teacher trainees from rural institutions.

5.5.1.1.4 **Socio-economic status of experimental and control groups**

The total sample is divided into two groups to represent experimental and control groups. The experimental group consists of 160 teacher trainees and control group consists of 80 teacher trainees. The average Socio-economic scores of experimental and control groups are calculated and are found to be 25.23 and 24.60 respectively. The scores are subjected to t-test for assessing their equality and is presented in Table 5.19.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>25.23</td>
<td>5.56</td>
<td>160</td>
<td>0.73</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Control</td>
<td>24.60</td>
<td>5.30</td>
<td>80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The result of t-test shows that the difference between mean Socio-economic scores of experimental and control groups is not statistically significant. So, it can be concluded that the teacher trainees forming experimental and control groups are identical with regard to their Socio-economic status. Hence the result proves that the selection of experimental and control groups is conducive for the study.
In order to ascertain the homogeneity of experimental and control groups with regard their Socio-economic status, the groups were further divided into sub groups. Gender, locality and management were considered for further analysis.

Table 5.20
Comparison of Mean of the Socio-economic Scores of Sub-groups of Experimental and Control groups

<table>
<thead>
<tr>
<th>Sub groups</th>
<th>Experimental</th>
<th>Control</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>No</td>
<td>Mean</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>25.03</td>
<td>5.43</td>
<td>40</td>
<td>23.32</td>
</tr>
<tr>
<td>Female</td>
<td>25.43</td>
<td>5.75</td>
<td>40</td>
<td>25.88</td>
</tr>
<tr>
<td>Locality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>28.25</td>
<td>4.41</td>
<td>40</td>
<td>27.80</td>
</tr>
<tr>
<td>Rural</td>
<td>22.2</td>
<td>4.94</td>
<td>40</td>
<td>21.4</td>
</tr>
<tr>
<td>Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Govt.</td>
<td>26.10</td>
<td>7.21</td>
<td>40</td>
<td>24.20</td>
</tr>
<tr>
<td>Pvt.</td>
<td>24.35</td>
<td>3.00</td>
<td>40</td>
<td>25.00</td>
</tr>
</tbody>
</table>

* not significant at 5 percent level

The Socio-economic status of experimental and control groups in different sub groups are also calculated and tested their equality using t-test. The results are shown in Table 5.20.

From Table 5.20, it can be seen that all the t-values are not statistically significant. It means that the difference in the Socio-economic scores of sub groups in experimental and control have more or less equal Socio-economic status. Even though there exist substantial differences among different sub
groups, the experimental and control in each sub group are homogenous in their Socio-economic status.

5.5.1.2 Academic achievement

The academic achievement of the teacher trainees is measured in terms of marks for the qualifying examination at graduate level.

The arithmetic mean of academic achievement for the total sample is found to be 22.36 with a standard deviation of 4.56. The score of the total sample ranges from the maximum of 34 to a minimum of 8. The academic achievement has a skewness of -0.46. The statistical parameters of the academic achievement indicate that the sample of teacher trainees is having diverse academic achievement with a higher proportion of above average students.

5.5.1.2.1 Academic achievement of teacher trainees from the government and the private institutions

When the sample of teacher trainees are divided into two according to the management of their institutions, the academic achievement score is found to be slightly higher among the teacher trainees from the Government institutions (23.05) than those from the private institutions (21.69). The result of t-test shows that the difference in the academic achievement scores of teacher trainees from the Government and the private institutions is not statistically significant at 0.01 level.
Table 5.21
Comparison of Mean of the Academic Achievement Scores of Teacher Trainees from the Government and the Private Institutions

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>23.05</td>
<td>4.81</td>
<td>120</td>
<td>2.34</td>
<td>0.02</td>
</tr>
<tr>
<td>Private</td>
<td>21.68</td>
<td>4.19</td>
<td>120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

So, as far as the academic achievement of teacher trainees are concerned, the difference is not much significant between Government and private institutions.

5.5.1.2.2 Academic achievement of male and female teacher trainees

The sample consists of 120 males and 120 female teacher trainees. The average academic achievement score of male and female teacher trainees are very much equal (22.65 and 22.09 respectively). The result of t-test given in Table 5.22 shows that the difference in academic achievement scores of male and female teacher trainees is insignificant.

Table 5.22
Comparison of Mean of the Academic Achievement Scores of Male and Female Teacher Trainees

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>22.65</td>
<td>4.97</td>
<td>120</td>
<td>0.95</td>
<td>0.386</td>
</tr>
<tr>
<td>Female</td>
<td>22.09</td>
<td>4.10</td>
<td>120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.5.1.2.3 Academic achievement of teacher trainees from urban and rural institutions.

The institutions are divided into two groups according to the place where they are situated. The sample consists of equal number of teacher trainees from urban institutions and as well as from rural institutions. The academic achievement scores of teacher trainees from urban institution is about three points higher than that of teacher trainees from rural institutions.

Table 5.23
Comparison of Mean of the Academic Achievement Scores of Teacher Trainees from Urban and Rural Institutions

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>23.84</td>
<td>4.22</td>
<td>80</td>
<td>4.28*</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Rural</td>
<td>20.90</td>
<td>4.41</td>
<td>80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* significant at 1 percent level

The result of t-test of the mean score, given in Table 5.23 shows that the difference in the academic achievement score of teacher trainees from urban and rural institutions are statistically significant. It means that as far as academic achievement is concerned, teacher trainees from urban and rural institutions are having the same level.

5.5.1.2.4 Academic achievement of experimental and control groups

The total sample is divided into two equal groups to represent experimental and control groups. The average academic achievement scores of experimental and control groups are calculated and are found to be 22.51
and 22.23 respectively. The scores are subjected to t-test for assessing their equality and is presented in Table 5.24.

**Table 5.24**

Comparison of Mean of the Academic Achievement Scores of Teacher Trainees from Experimental and Control Groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>22.51</td>
<td>4.11</td>
<td>80</td>
<td>0.39</td>
<td>&gt;0.5</td>
</tr>
<tr>
<td>Control</td>
<td>22.23</td>
<td>4.98</td>
<td>80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The result of t-test shows that the difference between mean academic achievement scores of experimental and control groups is not significantly different. So, it can be concluded that the teacher trainees forming experimental and control groups are identical with regards to their academic achievement. In order to ascertain the homogeneity of experimental and control groups with regard to their academic achievement, the groups were further divided into sub groups. Gender, locality and management were considered for further analysis.

**Table 5.25**

Comparison of Mean Socio-economic Scores of Sub-groups of Experimental and Control Groups

<table>
<thead>
<tr>
<th>Sub groups</th>
<th>Experimental</th>
<th>Control</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>No</td>
<td>Mean</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>22.95</td>
<td>4.52</td>
<td>40</td>
<td>22.35</td>
</tr>
<tr>
<td>Female</td>
<td>22.08</td>
<td>3.65</td>
<td>40</td>
<td>22.10</td>
</tr>
<tr>
<td>Locality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>23.48</td>
<td>4.31</td>
<td>40</td>
<td>24.20</td>
</tr>
<tr>
<td>Rural</td>
<td>21.55</td>
<td>3.70</td>
<td>40</td>
<td>20.25</td>
</tr>
<tr>
<td>Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Govt.</td>
<td>23.18</td>
<td>4.50</td>
<td>40</td>
<td>22.93</td>
</tr>
<tr>
<td>Pvt.</td>
<td>21.85</td>
<td>3.61</td>
<td>40</td>
<td>21.53</td>
</tr>
</tbody>
</table>
The academic achievement of experimental and control groups in different sub groups are also calculated and tested their equality using t-test. The results are presented in Table 5.25.

From Table 5.25, it can be seen that all the t-values are not statistically significant. So, the difference in the academic achievement of experimental and control groups in different sub samples are not statistically significant. It means that even though there exists difference in the academic achievement of different sub samples, the experimental and control groups in each sub sample are homogenous with regard to academic achievement.

5.5.2 **Effectiveness of Modern Instructional Strategies.**

Teaching has now become more difficult. According to Joseph (2000), higher educational expectations, greater curricular demand, rapid changes in knowledge and technology and the subsequent difficulties involving keeping abreast of things make teaching difficult. Hence, modern instructional strategies for learning are to be more effective and efficient.

The effectiveness of Modular and Mastery Learning strategies were tested by applying them on two separate experimental groups of teacher trainees selected systematically from four randomly selected institutions from Kerala. The experimental group for testing Modular strategy consisted of 80 teacher trainees and another group of 80 teacher trainees form the experimental group for testing Mastery Learning strategy. The common control group consisted of another 80 teacher trainees.
The test items were prepared from the content area of the B.Ed. syllabus "Individual Difference: Heredity and Environment" in Educational Psychology for achievement test. The first experimental group was subjected to learn the topic through Modular Learning strategy and the second experimental group was subjected to learn the same topic through Mastery Learning strategy. The control group was taught the same topic in conventional method.

5.5.2.1 Effectiveness of Modular Learning strategy

Modular Learning strategy used modules as the basic unit of instruction (prepared by the investigator). Module is a self-learning package which contain everything needed for self instruction. It could be conceived as a self contained and self sufficient unit developed for a target population of learners for realizing selected specific instructional objectives, says Hopper (1982). The topic for the module was selected after examining the content of the B.Ed. curriculum and discussions with teacher educators and subject experts. The topic was broken down to three subunits and each unit covers the content, objectives, instructional strategies and evaluation aspects.

A draft form of the achievement test was prepared with 80 items. After item analysis procedure, 20 items were deleted. The remaining 40 items were administered to 80 teacher trainees and their achievement was evaluated. The maximum score of the achievement test is 40. The achievements of the experimental group were compared to that of the control group who were administered conventional method.
Figure 5.1 depicts the distribution of experimental and control groups according to their achievement in Modular Learning strategy. The frequency curves showing the percentage of teacher trainees of experimental and control groups in different intervals of achievement scores, depict a very clear picture of the significantly large difference between the achievement levels of the two groups – in regard to the percentage of high level score achievers as well as the level of high score itself; as also the mean achievement score. The frequency curve of the experimental group is more skewed to the left - left skewness implying more concentration of teacher trainees towards the high achievement scores side.

Table 5.26 shows the results of comparison of achievement of the experimental and control groups. It can be seen from the table that the average score of the experimental group is 28.75 with a standard deviation of
4.31. The average score of the control group is 23.81 with a standard deviation of 5.01.

Table 5.26

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>28.75</td>
<td>4.31</td>
<td>80</td>
<td>6.65**</td>
<td>&gt; 0.01</td>
</tr>
<tr>
<td>Control</td>
<td>23.81</td>
<td>5.01</td>
<td>80</td>
<td>**</td>
<td></td>
</tr>
</tbody>
</table>

** significant at 1 percent level

When the achievement scores of experimental and control groups are compared using t statistics, the value of t is found to be 6.65 which is significant at 0.01 level ($t = 6.65; p < 0.01$). It means that teacher trainees who were administered Modular Learning strategy achieved significant improvement over those who were taught through conventional method. The result thus indicates that Modular Learning strategy is more effective than conventional method of learning. This result is very much similar to that of Hopper (1982), who studied the achievement of students with modular instruction involving peer-group learning with and without teacher intervention.

5.5.2.1.1 Effectiveness of Modular Learning strategy with regard to gender

The sample is divided into two with regard to the gender of the teacher trainees. Comparison of achievement of experimental and control groups was carried out separately for males and females in order to find out gender
difference in the achievement through Modular Learning strategy. Table 5.27 presents the result of comparison using t statistic.

Table 5.27
Comparison of Mean Achievement Scores of Experimental and Control Groups of Modular Learning Strategy with regard to Gender.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Experimental</td>
<td>27.75</td>
<td>4.38</td>
<td>40</td>
<td>2.10*</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Female</td>
<td>29.75</td>
<td>4.04</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Control</td>
<td>23.78</td>
<td>5.62</td>
<td>40</td>
<td>0.07</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Female</td>
<td>23.85</td>
<td>4.50</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Experimental</td>
<td>27.75</td>
<td>4.38</td>
<td>40</td>
<td>3.49**</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Control</td>
<td>23.78</td>
<td>5.62</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>29.75</td>
<td>4.04</td>
<td>40</td>
<td>6.09**</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Control</td>
<td>23.85</td>
<td>4.50</td>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*significant at 5 percent level  **significant at 1 percent level

The t statistics of the comparison of means is found to be 2.096, which is significant at five percent level of significance. So, as far as Modular Learning strategy is concerned, females got significantly higher achievement as compared to males. But in the case of control group, the difference in the scores of achievement among males and females is not statistically significant (t=0.07). Thus, the result shows that the conventional method does not have any considerable difference based on gender; but Modular Learning strategy has a positive significance in favour of females.

When the experimental and control groups of male students are concerned, the t statistic is found to be 3.49. In the case of female students,
the corresponding $t$ statistic is 6.09. In both the cases, the $t$ values are statistically significant. The result indicates that among males and females, Modular Learning strategy has significant improvement over conventional method.

5.5.2.1.2 Effectiveness of Modular Learning strategy with regard to locale

When the sample is divided into two with regard to the locality of the institution, it can be seen that when rural teacher trainees achieved an average score of 27.33 with standard deviation of 4.68, urban teacher trainees achieved a higher score of 30.18 with standard deviation of 4.09 through Modular Learning strategy. The difference between the average scores of achievement of rural and urban teacher trainees is found to be statistically significant ($t=3.08$). But in the case of control group, the difference in the score of rural and urban teacher trainees is not statistically significant ($t=1.47$). The result shows that when Conventional method does not show significant difference among rural and urban teacher trainees, Modular Learning strategy exhibit substantial difference which is beneficial to urban teacher trainees.
Table 5.28
Comparison of Mean Achievement Scores of Experimental and Control Groups of Modular Learning Strategy with regard to Locale.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>27.33</td>
<td>4.08</td>
<td>40</td>
<td>3.08**</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Urban</td>
<td>30.18</td>
<td>4.09</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>22.96</td>
<td>5.82</td>
<td>40</td>
<td>1.47</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Urban</td>
<td>24.65</td>
<td>4.07</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Rural</td>
<td>27.33</td>
<td>4.08</td>
<td>40</td>
<td>3.82**</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>22.98</td>
<td>5.82</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>24.65</td>
<td>4.07</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Urban</td>
<td>30.18</td>
<td>4.09</td>
<td>40</td>
<td>5.97**</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

**significant at 1 percent level

The effectiveness of Modular strategy among rural and urban teacher trainees was evaluated by comparing the average score of corresponding experimental and control groups. The t statistics of rural and urban teacher trainees are found to be 3.82 and 5.97 respectively. The difference in the average scores of experimental and control groups is significant at 5 percent level of significance. Thus the results indicate that the achievement through Modular Learning is higher among rural and urban teacher trainees. Among rural and urban teacher trainees more achievement was for urban teacher trainees.
5.5.2.1.3 Effectiveness of Modular Learning strategy with regard to management of institution

The effectiveness of Modular Learning strategy among teacher trainees from Government institutions and private institutions was studied. Table 5.29 shows that the average scores of achievement through Modular Learning strategy for among teacher trainees from Government and private institutions are 27.9 (SD = 4.47) and 29.60 (SD = 4.02) respectively. The t statistics (1.78) is not significant at 5 percent level of significance. Similarly among control groups the t statistics of the difference of mean scores is 1.93, which is also not significant at 5 percent level of significance. The results indicate that in the case of Modular strategy and Conventional method, there is no significant difference in the achievement of teacher trainees from Government and private institutions.

Table 5.29
Comparison of Mean Achievement Scores of Experimental and Control Groups of Modular Learning Strategy with regard to Management of Institution.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>27.90</td>
<td>4.47</td>
<td>40</td>
<td>1.77</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Private</td>
<td>29.60</td>
<td>4.02</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>22.73</td>
<td>4.49</td>
<td>40</td>
<td>1.93</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Private</td>
<td>24.90</td>
<td>5.41</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>27.90</td>
<td>4.47</td>
<td>40</td>
<td>5.11**</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Control</td>
<td>22.73</td>
<td>4.49</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>29.60</td>
<td>4.02</td>
<td>40</td>
<td>4.36**</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Control</td>
<td>24.90</td>
<td>5.41</td>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**significant at 1 percent level
The effectiveness of Modular Learning strategy and Conventional Learning method among students from Government and private institutions were also evaluated. The $t$ statistics of the difference between the average scores of experimental and control groups among teacher trainees from Government and private institutions are found to be 5.11 and 4.36 respectively. Both $t$ values are significant at 1 percent level of significance and the average achievement scores for experimental groups are higher than corresponding control groups. So, it can be concluded that among teacher trainees from both Government and private institutions, Modular Learning strategy is more effective than the Conventional Learning method.

5.5.2.1.4 Impact of Socio-economic Status and academic achievement on Modular Learning strategy

The impacts of Socio-economic status and academic achievement at graduate level on Modular Learning strategy were studied using ANOVA and Pearson's Correlation Coefficient. Socio-economic status is taken as a continuous variable whose values range from 3 to 30. Academic achievement at graduate level is also taken as a continuous variable whose values range from 8 to 34. The average value of socio-economic status is 20.86 with a standard deviation of 5.32. The average value of academic achievement at graduate level is 22.36 with a standard deviation of 4.55. The achievement through Modular Learning strategy ranges from 19 to 41. The
average score of achievement through Modular Learning strategy is 28.68 with a standard deviation of 4.30.

In order to study the impact of socio-economic status on achievement through Modular Learning strategy, the score of socio-economic status was grouped into three, namely High, Medium and Low groups. The teacher trainees with status score above mean + standard deviation is taken as High group and those who have status score below mean – standard deviation as Low group. Teacher trainees who have score in between High group and Low group are taken as Medium group. The mean of the modular scores of teacher trainees in high, medium and low groups are 26.58 (SD = 5.48), 26.65 (SD = 5.15) and 23.80 (SD = 5.55) respectively. Table 5.30 present the results of ANOVA of the achievement through Modular learning with socio-economic status. It can also be seen that F statistics is not significant at 5 percent level of significance. The result thus indicates that socio-economic status of teacher trainees no significant impact on their achievement through Modular Learning.
Table 5.30
Significance of Difference among Mean Scores of Teacher Trainees of different Socio-economic Status through Modular Learning: Analysis of Variance

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>140.8018</td>
<td>2</td>
<td>70.4009</td>
<td>2.557</td>
<td>0.0807</td>
</tr>
<tr>
<td>Within Groups</td>
<td>4321.542</td>
<td>157</td>
<td>27.52574</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4462.344</td>
<td>159</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Similarly, the impact of teacher trainees achievement at graduate level on their achievement through Modular Learning is also studied by ANOVA. The teacher trainees were also grouped into three, namely high group, medium group and low group with regard their achievement at graduate level was also grouped. Mean ± standard deviation is taken as the criterion of grouping. The average scores of achievement through Modular learning in high, medium and low are 27.13 (SD = 4.83), 26.36 (SD = 5.25) and 24.55 (SD = 6.06) respectively. Table 5.31 presents the results of ANOVA of the achievement through Modular Learning among against achievement at graduate level. It can also be seen that F statistics is not significant at 5 percent level of significance. It means that achievement at graduate level does not have any significant influence in the achievement through Modular Learning strategy.
### Table 5.31
Significance of Difference among Mean Scores of Teacher Trainees of different Academic Achievement at Graduate Level through Modular Learning Strategy: Analysis of Variance.

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>82.47</td>
<td>2</td>
<td>41.23</td>
<td>1.478</td>
<td>0.231</td>
</tr>
<tr>
<td>Within Groups</td>
<td>4379.87</td>
<td>157</td>
<td>27.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4462.34</td>
<td>159</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The impact of Socio-economic status and achievement at graduate level on the sub-samples of the teacher trainees was studied by Carl Pearson’s Coefficient of Correlation. The Correlation Coefficient of the achievement score through Modular Learning strategy is given in Table 5.32.

### Table 5.32
Correlation Coefficients of Achievement through Modular Learning Strategy with Socio-economic Status and Achievement at Graduate Level of the Sample

<table>
<thead>
<tr>
<th>Sample</th>
<th>Correlation with Socio-economic Status</th>
<th>Correlation with Achievement at Graduate level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0.239</td>
<td>0.035</td>
</tr>
<tr>
<td>Rural</td>
<td>0.223</td>
<td>-0.056</td>
</tr>
<tr>
<td>Urban</td>
<td>-0.108</td>
<td>-0.040</td>
</tr>
<tr>
<td>Private</td>
<td>0.152</td>
<td>-0.052</td>
</tr>
<tr>
<td>Government</td>
<td>0.347*</td>
<td>0.158</td>
</tr>
<tr>
<td>Male</td>
<td>0.244</td>
<td>-0.182</td>
</tr>
<tr>
<td>Female</td>
<td>0.229</td>
<td>0.027</td>
</tr>
</tbody>
</table>

*significant at 5 percent level
Table 5.32 shows that the Correlation Coefficients of achievement through modular learning strategy with Socio-economic status and academic achievement at graduate level are positive in total experimental group. But, the Correlation Coefficients are not significant.

The Correlation Coefficient of achievement through Modular Learning strategy with Socio-economic status is positive in all sub groups except in urban sample. The result indicates that in case of urban teacher trainees, as their Socio-economic status increases the achievement through Modular Learning strategy decreases. In all other sub groups as their Socio-economic status increases, their achievement through Modular Learning strategy also increases. The Correlation Coefficient is found to be significant only among teacher trainees from Government institutions.

As far as Correlation Coefficient of achievement through Modular Learning strategy with academic achievement at graduate level is concerned the total sample has a positive correlation. It means that as the academic achievement at graduate level increases, achievement through Modular Learning strategy also increases. Female teacher trainees and trainees from Government institutions also show a positive correlation. In all other sub groups the correlation coefficients are negative. None of the Correlation Coefficient is statistically significant. From the above analysis it is found that socio-economic status and academic achievement at graduate level do not have much impact in the achievement of teacher trainees through Modular Learning strategy except among teacher trainees from the Government
institutions. In the case of teacher trainees from the Government institutions, Socio-economic status has a strong positive impact on the achievement through Modular Learning strategy.

5.5.2.1.5 Combined Impact of independent variables on achievement through Modular Learning strategy

The combined impact of independent variables such as, place and type of management of institution, gender of the teacher trainees and their achievement at graduate level and socio-economic status on achievement through Modular Learning strategy was studied using regression analysis. Place of the institution, type of management and gender of teacher trainees are taken as dummy variables. Academic achievement at graduate level and socio-economic status score are taken as continuous variables. The result of analysis is given in Table 5.33.

The $R^2$ of the regression is found to be 0.214. It means that 21.4 percent of the variation in the achievement through Modular Learning strategy is explained by the five independent variables. Among the independent variables, achievement at the graduate level and socio-economic status of teacher trainees are not significant ($p > 0.05$). The result indicates that as far as achievement through Modular Learning strategy is concerned, achievement at graduate level and socio-economic status of teacher trainees have no significant effect.
Table 5.33
Regression of Achievement through Modular Learning Strategy on Selected Independent Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>27.490</td>
<td>2.915</td>
<td>9.432**</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Place of the institution</td>
<td>2.314</td>
<td>1.072</td>
<td>0.270</td>
<td>2.158**</td>
<td>0.034</td>
</tr>
<tr>
<td>Management of the institution</td>
<td>-1.850</td>
<td>0.907</td>
<td>-0.216</td>
<td>-2.040*</td>
<td>0.045</td>
</tr>
<tr>
<td>Gender of the trainees</td>
<td>-1.965</td>
<td>0.890</td>
<td>-0.230</td>
<td>-2.209*</td>
<td>0.030</td>
</tr>
<tr>
<td>Achievement at the graduate level</td>
<td>0.006</td>
<td>0.114</td>
<td>0.005</td>
<td>0.050</td>
<td>0.961</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td>0.089</td>
<td>0.100</td>
<td>0.112</td>
<td>0.888</td>
<td>0.378</td>
</tr>
</tbody>
</table>

* significant at 5 percent level  ** significant at 1 percent level

Table 5.34 presents the result of regression analysis using independent variables which are having significant impact of achievement through Modular Learning strategy.

Table 5.34
Regression of Achievement through Modular Learning Strategy on Independent Variables which are having Significant Impact

<table>
<thead>
<tr>
<th>(Constant)</th>
<th>29.175</th>
<th>0.875</th>
<th>33.329</th>
<th>0.000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place of the institution</td>
<td>2.850</td>
<td>0.875</td>
<td>0.333</td>
<td>3.256</td>
</tr>
<tr>
<td>Management of the institution</td>
<td>-1.700</td>
<td>0.875</td>
<td>-0.199</td>
<td>-1.942</td>
</tr>
<tr>
<td>Gender of the trainees</td>
<td>-2.000</td>
<td>0.875</td>
<td>-0.234</td>
<td>-2.285</td>
</tr>
</tbody>
</table>

So, the final regression equation for the achievement through Modular Learning strategy ($A_{mod}$) is
\[ A_{\text{mod}} = 29.175 + 2.85X_1 - 1.7X_2 - 2.0X_3 \] — (1)

where

\[ X_1 = \text{place (1 if Urban, 0 otherwise)}, \]
\[ X_2 = \text{management (1 if Government, 0 otherwise) and} \]
\[ X_3 = \text{gender (1 if male, 0 otherwise)}. \]

The regression equation (1) indicates that the achievement through Modular Learning strategy is 2.85 points higher among teacher trainees from urban area as compared to those from rural area. But at the same time, teacher trainees from the Government institutions achievement score is 1.7 points less than their counterparts from private institutions. Similarly, the regression equation also indicates that the achievement of male teacher trainees is 2.0 points less than that of female teacher trainees.

The \( R^2 \) of the regression equation is 0.205. It means that 20.5 percent of the variations in the achievement through Modular Learning strategy is explained by the three independent variable, namely locale, type of management and gender of teacher trainees. The individual contribution of independent variables are calculated using the formula

\[ R^2 = \beta_1 r_1 + \beta_2 r_2 + \beta_3 r_3 \] — (2) Garrett\(^12\) (1981).

where

\[ \beta_i = \text{beta coefficient of } i^{th} \text{ variable and} \]
\[ r_i = \text{correlation of } i^{th} \text{ variable with dependent variable.} \]

The numerical values of the above equation is as follows.

\[ 0.205 = 0.111 + 0.039 + 0.055 \]

From the result, it can be seen that the contributions of place, management and gender are 11.1, 3.9 and 5.5 percent respectively. Hence it can be concluded that among these independent variable, place of institution
exerts more influence on the achievement of teacher trainees through Modular Learning strategy.

5.5.2.2 Effectiveness of Mastery Learning Strategy (MLS)

According to Deshpande, Shashikala and Hadli (1994), mastery learning is a strategy which is based on the assumption that most students can learn effectively if given enough time and taught well. The Mastery Learning Model formulated by Carroll (1971) and Bloom (1971) has found application in understanding the factors responsible for enhancing achievement [Aranha (1988) and Patadia (1987)]. Studies in the area of Mastery Learning conducted at different levels of education have revealed that it is more effective than the conventional or other method of teaching.

A draft form of the achievement test was prepared with 60 items. After item analysis procedure, 20 items were deleted. The remaining 40 items were administered to 80 teacher trainees and their achievement was evaluated. The maximum score of the achievement test is 40. The achievements of the experimental group were compared to that of the control group who were administered conventional method.

Figure 5.2 depicts the distribution of experimental and control groups according to their achievement in Mastery Learning effectiveness test. The frequency curves showing the percentage of teacher trainees of experimental and control groups in different intervals of achievement scores, depict an intuitively very clear picture of the significantly large difference between the achievement levels of two groups – in regard to the percentage of high level
score achievers as well as the level of high score itself; as also the mean achievement score. The frequency curve of the experimental group is more skewed to the left - left skewness implying more concentration of teacher trainees towards the high achievement scores side.

Table 5.35 shows the result of comparison of mean achievement of the experimental and the control groups. It can be seen from the table that the average score of the experimental group is 26.68 with a standard deviation of 4.50. The average score of the control group is 23.81 with a standard deviation of 5.01.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>26.68</td>
<td>4.50</td>
<td>80</td>
<td>0.00</td>
<td>6.64*</td>
</tr>
<tr>
<td>Control</td>
<td>23.81</td>
<td>5.01</td>
<td>80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* significant at 1 percent level
When the achievement scores of experimental and control groups are compared using t statistics, the value of t is found to be 6.64. The t value is significant at 1 percent level of significance. Hence, the difference between the mean scores of experimental and control groups are substantially different. It means that teacher trainees who were administered Mastery Learning strategy achieved significant improvement over those who were taught by conventional method. The result thus indicates that Mastery Learning strategy is more effective than conventional method. The result is supported by the studies of Deshpande and Hadli\textsuperscript{18} (1994), Kapoor\textsuperscript{19} (1989), Chaudhari and Vaidya\textsuperscript{20} (1988), Hooda\textsuperscript{21} (1984) and Yadav\textsuperscript{22} (1984).

5.5.2.2.1 Effectiveness of Mastery Learning strategy with regard to gender

In order to study the gender difference in the effectiveness of Mastery Learning strategy, the sample is divided into two with regard to the gender of the teacher trainees. Comparison of achievement in experimental and control groups was carried out separately for males and females. Table 5.36 presents the result of comparison using t statistic.
Table 5.36
Comparison of Mean Achievement Scores of Experimental and Control Groups with regard to Gender on MLS

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Male</td>
<td>25.78</td>
<td>4.70</td>
<td>40</td>
<td>1.81</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Female</td>
<td>27.6</td>
<td>4.16</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Male</td>
<td>23.78</td>
<td>5.62</td>
<td>40</td>
<td>0.06</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Female</td>
<td>23.85</td>
<td>4.50</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Experimental</td>
<td>25.78</td>
<td>4.70</td>
<td>40</td>
<td>1.71</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Control</td>
<td>23.78</td>
<td>5.62</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female Experimental</td>
<td>27.60</td>
<td>4.16</td>
<td>40</td>
<td>3.82**</td>
<td>&gt; 0.01</td>
</tr>
<tr>
<td>Control</td>
<td>23.85</td>
<td>4.50</td>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**significant at 1 percent level

The t statistic of the comparison of means is found to be 1.81, which is not significant at 5 percent level of significance. So, as far as Mastery Learning strategy is concerned, there is no significant difference in the achievement of males and females. Similarly, in the case of control group, the difference in the scores of achievements among males and females is not statistically significant (t=0.06). Thus, the result shows that the Mastery Learning strategy as well as conventional method does not have any considerable impact on the gender difference of teacher trainees.

When the experimental and control groups of male students are concerned, the t statistic is found to be 1.71. In the case of female students, the corresponding t statistic is 3.82. The t statistic is not significant among males and that is significant among females. So Mastery Learning strategy
does not made any improvement among male teacher trainees. But in the case of female teacher trainees, Mastery Learning strategy has significant positive effect.

5.5.2.2.2 Effectiveness of Mastery Learning strategy with regard to locale

The difference between the average scores of achievement of rural and urban students is found to be statistically significant ($t=2.95$). But in the case of control group, the difference in the score of rural students and urban students is not statistically significant ($t=1.47$). The result shows that when conventional method does not show significant difference among rural and urban teacher trainees, Mastery Learning strategy exhibits substantial difference among teacher trainees of different locale and is more beneficial to urban teacher trainees.

Table 5.37

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>25.25</td>
<td>4.30</td>
<td>40</td>
<td>2.95**</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Urban</td>
<td>28.12</td>
<td>4.29</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>22.98</td>
<td>5.81</td>
<td>40</td>
<td>1.47</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Urban</td>
<td>24.65</td>
<td>4.07</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>25.25</td>
<td>4.30</td>
<td>40</td>
<td>1.97</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>22.97</td>
<td>5.81</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>24.65</td>
<td>4.07</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>28.13</td>
<td>4.29</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>22.97</td>
<td>5.81</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>24.65</td>
<td>4.07</td>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**significant at 1 percent level

The effectiveness of Mastery Learning strategy among rural and urban teacher trainees was evaluated by comparing the average score of
corresponding experimental and control groups. The t statistics of rural and urban students are found to be 1.97 and 3.68. Since both of the t statistics are significant at 5 percent level of significance, the difference in the average scores of experimental and control groups are substantial. Thus the results indicate that the achievement through Mastery Learning strategy is higher among rural and urban teacher trainees as compared to those who were taught through conventional method. Among rural and urban students more achievement was for urban students.

5.5.2.2.3 Effectiveness of Mastery Learning strategy with regard to management of institution

The t statistics (1.66) is not significant at 5 percent level of significance, the difference between the scores of teacher trainees from Government and private institutions are more or less the same. Similarly among control groups the t statistics of the difference of mean scores is 1.94, which is also not significant at 5 percent level of significance. The results indicate that in the case of Mastery Learning strategy and conventional Learning methods, there is no significant difference in the achievement of teacher trainees from Government and private institutions.

The effectiveness of Mastery Learning strategy and conventional Learning method among teacher trainees from Government and private institutions was also evaluated. The t statistics of the difference between the average scores of experimental and control groups among teacher trainees from Government and private institutions are found to be 2.98 (p < 0.01) and
2.41 ($p < 0.05$) respectively. So, it can be concluded that among teacher trainees from both Government and private institutions, Mastery Learning strategy is more effective than the conventional Learning method.

**Table 5.38**

Comparison of Mean Achievement Scores of Experimental and Control Groups under different Management on MLS

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Government</td>
<td>25.85</td>
<td>4.75</td>
<td>40</td>
<td>1.66</td>
</tr>
<tr>
<td></td>
<td>Private</td>
<td>27.52</td>
<td>4.14</td>
<td>40</td>
<td>1.94</td>
</tr>
<tr>
<td>Control</td>
<td>Government</td>
<td>22.72</td>
<td>4.49</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Private</td>
<td>24.90</td>
<td>5.41</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>Experimental</td>
<td>25.85</td>
<td>4.75</td>
<td>40</td>
<td>2.98**</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>22.73</td>
<td>4.49</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>Experimental</td>
<td>27.53</td>
<td>4.14</td>
<td>40</td>
<td>2.41*</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>24.90</td>
<td>5.41</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

*significant at 5 percent level  **significant at 1 percent level

The above analysis categorically proved that Mastery Learning strategy is definitely superior to the conventional learning method. The result is in line with the findings of Patadia$^{23}$ (1991), Chaudhari and Vaidya$^{24}$ (1988), Strasler$^{25}$ (1983), Crawford$^{26}$ (1972), Kersh$^{27}$ (1970) and Kim$^{28}$ (1969). A conclusion coming out of these studies indicates that it is possible to improve mastery level of the students through the Mastery Learning strategy. According to Patadia$^{29}$ (1991), the Mastery Learning strategy increases the quality of teaching on the part of the teacher and ability to learn on the part of a student.
5.5.2.2.4 Impacts of Socio-economic status and academic achievement on Mastery Learning strategy

The impact of Socio-economic status and academic achievement at graduate level on the achievement through Mastery Learning strategy was also studied using Pearson's Product Moment Correlation Coefficient. The achievement through Mastery Learning strategy ranges from 16 to 32. The average score of achievement through Mastery Learning strategy is 26.68 with a standard deviation of 4.50.

In order to study the impact of Socio-economic status on achievement through Mastery Learning strategy, the score of Socio-economic status was grouped into three, namely High, Medium and Low groups as in section 5.4.2.1.4). The mean of mastery learning scores of teacher trainees in high, medium and low groups are 24.29 (SD = 3.57), 22.95 (SD = 3.94) and 21.30 (SD = 3.88) respectively. Table 5.39 present the results of ANOVA of the achievement through Mastery learning with Socio-economic status. From Table 5.24, it can be seen that F statistics is not significant at 5 percent level of significance. The result thus indicates that Socio-economic status of teacher trainees has no significant impact on the their achievement through mastery learning strategy.
Table 5.39
Significance of Difference among Mean Scores of Teacher Trainees of Different Socio-economic Status through MLS: Analysis of variance.

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>f</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>127.06</td>
<td>2</td>
<td>63.53</td>
<td>2.605</td>
<td>0.077</td>
</tr>
<tr>
<td>Within Groups</td>
<td>3828.94</td>
<td>157</td>
<td>24.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3956</td>
<td>159</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Similarly, the impact of teacher trainees' achievement at graduate level on their achievement through Mastery Learning is also studied by ANOVA. The teacher trainees were also grouped into three, namely high group, medium group and low group with regard their achievement at graduate level was also grouped. Mean ± standard deviation is taken as the criterion of grouping. The average scores of achievement through Mastery learning in high, medium and low are 23.67 (SD = 3.74), 22.65 (SD = 4.08) and 23.50 (SD = 3.28) respectively. Table 5.25 presents the results of ANOVA of the achievement through Mastery Learning among against achievement at graduate level. From Table 5.40, it can be seen that F statistics is not significant at 5 percent level of significance. It means that achievement at graduate level does not have any significant influence in the achievement through Mastery Learning strategy.
Table 5.40
Significance of Difference among Mean Scores of Teacher Trainees of different Academic Achievement at Graduate Level through MLS: Analysis of Variance

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>78.09</td>
<td>2</td>
<td>39.048</td>
<td>1.581</td>
<td>0.209</td>
</tr>
<tr>
<td>Within Groups</td>
<td>3877.91</td>
<td>157</td>
<td>24.700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3956</td>
<td>159</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The impact of Socio-economic status and achievement at graduate level on the achievement through Mastery Learning strategy of the subsamples of the teacher educators was studied by Carl Pearson's Coefficient of Correlation. The Correlation coefficient of the achievement score through Mastery Learning strategy is given in Table 5.41.

Table 5.41 shows that the Correlation Coefficient of achievement through Mastery learning strategy with Socio-economic status and academic achievement at graduate level is positive in total experimental group. But, the Correlation Coefficients are not significant.
Table 5.41
Correlation Coefficients of Achievement through Mastery Learning Strategy with Socio-economic Status and Achievement at Graduate Level of the Sample

<table>
<thead>
<tr>
<th>Sample</th>
<th>Correlation with Socio-economic Status</th>
<th>Correlation with Achievement at Graduate level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0.221</td>
<td>0.059</td>
</tr>
<tr>
<td>Rural</td>
<td>0.194</td>
<td>-0.025</td>
</tr>
<tr>
<td>Urban</td>
<td>-0.108</td>
<td>-0.013</td>
</tr>
<tr>
<td>Private</td>
<td>0.115</td>
<td>-0.013</td>
</tr>
<tr>
<td>Government</td>
<td>0.327*</td>
<td>0.166</td>
</tr>
<tr>
<td>Male</td>
<td>0.229</td>
<td>-0.036</td>
</tr>
<tr>
<td>Female</td>
<td>0.207</td>
<td>0.149</td>
</tr>
</tbody>
</table>

*significant at 5 percent level

The Correlation Coefficient with Socio-economic status is positive in all sub groups except urban sample. The result indicates that in urban students as Socio-economic status increases the achievement through Mastery Learning strategy also decreases. In all other sub groups as their Socio-economic status increases, their achievement through Mastery learning strategy also increases. The Correlation Coefficient is found to be significant only in students from Government institutions.

As far as Correlation Coefficient of achievement through Mastery Learning strategy with academic achievement at graduate level is concerned the total sample has a positive correlation. It means that as the academic achievement at graduate level increases, achievement through Mastery Learning strategy also increases. Female teacher trainees and trainees from
the Government institutions also show a positive correlation. In all other subgroups the correlation are negative. None of the correlation coefficient is statistically significant. From the above analysis it is found that socio-economic status and academic achievement at graduate level do not have much influence in the achievement of students through Mastery Learning strategy except among students from government institutions. In the case of students from Government institutions, Socio-economic status has a strong positive influence in the achievement through Mastery Learning strategy.

5.5.2.2.5 Combined impact of independent variables on achievement through Mastery Learning strategy

The combined impact of independent variables such as, place and type of management of institution, gender of the teacher trainees and their achievement at graduate level and socio-economic status on achievement through Mastery Learning was studied using regression analysis. Place of the institution, type of management and gender of teacher trainees are taken as dummy variables. Academic achievement at graduate level and socio-economic status score are taken as continuous variables. The result of analysis is given in Table 5.42.

The $R^2$ of the regression is found to be 0.187. It means that 18.7 percent of the variation in the achievement through Mastery Learning strategy is explained by the five independent variables. Among the independent variables, achievement at the graduate level and Socio-economic status of teacher trainees are not significant ($p > 0.05$).
Table 5.42
Regression of Achievement through Mastery Learning Strategy on selected Independent Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>24.974</td>
<td>3.101</td>
<td>8.054</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Place of the institution</td>
<td>2.362</td>
<td>1.141</td>
<td>0.264</td>
<td>2.071</td>
<td>0.042</td>
</tr>
<tr>
<td>Management of the institution</td>
<td>-1.841</td>
<td>0.965</td>
<td>-0.206</td>
<td>-1.909</td>
<td>0.050</td>
</tr>
<tr>
<td>Gender of the trainees</td>
<td>-1.820</td>
<td>0.946</td>
<td>-0.203</td>
<td>-1.923</td>
<td>0.058</td>
</tr>
<tr>
<td>Achievement at the graduate level</td>
<td>0.034</td>
<td>0.121</td>
<td>0.031</td>
<td>0.277</td>
<td>0.783</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td>0.076</td>
<td>0.107</td>
<td>0.091</td>
<td>0.712</td>
<td>0.479</td>
</tr>
</tbody>
</table>

The result indicates that as far as achievement through Mastery Learning strategy is concerned, achievement at graduate level and Socio-economic status of teacher trainees have any effect.

Table 5.43 presents the result of regression analysis using independent variables which are having significant impact of achievement through Mastery Learning strategy.
Table 5.43
Regression of Achievement through Mastery Learning Strategy on independent variables which are having significant impact

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>27.00</td>
<td>0.930</td>
<td>29.027</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Place of the institution</td>
<td>2.875</td>
<td>0.930</td>
<td>0.321</td>
<td>3.091</td>
<td>0.003</td>
</tr>
<tr>
<td>Management of the institution</td>
<td>-1.675</td>
<td>0.930</td>
<td>-0.187</td>
<td>-1.801</td>
<td>0.076</td>
</tr>
<tr>
<td>Gender of the trainees</td>
<td>-1.825</td>
<td>0.930</td>
<td>-0.204</td>
<td>-1.962</td>
<td>0.050</td>
</tr>
</tbody>
</table>

So, the final regression equation for the achievement through Mastery Learning strategy \(A_{mas}\) is

\[
A_{mas} = 27.00 + 2.88X_1 - 1.68X_2 - 1.83X_3 \quad -(3)
\]

where

\(X_1\) = place (if Urban, 0 otherwise),
\(X_2\) = management (1 if Government, 0 otherwise) and
\(X_3\) = gender (1 if male, 0 otherwise).

The regression equation (3) indicates that the achievement through Mastery Learning strategy is 2.88 points higher among teacher trainees from urban area as compared to those from rural area. But at the same time, teacher trainees from the Government institutions achievement score is 1.68 points less than their counterparts from private institutions. Similarly, the regression equation also indicates that the achievement of male teacher trainees is 1.83 points less than that of female teacher trainees.
The $R^2$ of the regression equation is 0.180. It means that 18.0 percent of the variations in the achievement through Mastery Learning strategy is explained by the three independent variable, namely locale, type of management and gender of teacher trainees. The individual contribution of independent variables are calculated using the equation (2). The numerical values of the above equation is as follows.

$$0.180 = 0.103 + 0.035 + 0.042$$

From the result, it can be seen that the contributions of place, management and gender are 10.3, 3.5 and 4.2 percent respectively. Hence it can be concluded that among these independent variable, place of institution exerts more influence on the achievement of teacher trainees through Mastery Learning strategy.

5.5.2.6 **Comparison of Modular Learning and Mastery Learning strategies**

Modular learning and Mastery learning strategies are two modern approaches which are tested for their effectiveness over conventional method of learning. Both strategies show a considerable improvement in the learning process as compared to the conventional method. Among these strategies Modular strategy is found to be better than Mastery Learning strategy. Table 5.44 gives the result of comparison of the achievement of Modular and Mastery Learning strategy in the experimental sample.
Table 5.44
Comparison of Mean Achievement Scores through Modular and Mastery Learning Strategies

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modular</td>
<td>28.68</td>
<td>4.30</td>
<td>80</td>
<td>2.85**</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Mastery</td>
<td>26.68</td>
<td>4.50</td>
<td>80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**significant at 1 percent level

Since t value is significant at 5 percent level of significance, there is significant difference in the achievement through Modular and Mastery learning strategies. The mean score of achievement through Modular Learning strategy is about two points greater than that of the achievement through Mastery Learning strategy. The standard deviations of achievement through both the strategies are more or less the same. So it can be concluded that Modular Learning strategy is more effective than Mastery Learning strategy.

In order to compare the effectiveness of Modular and Mastery Learning strategies among the sub groups of the sample, the sample is divided into sub groups with respect to gender, locality and management of the institutions. The mean achievement scores of the sub samples are tested and the results are presented in Table 5.45.
Table 5.45
Comparison of Mean Achievement Scores through Modular and Mastery Learning Strategies among the Sub samples

<table>
<thead>
<tr>
<th>Sub Sample</th>
<th>Modular Mean</th>
<th>Modular SD</th>
<th>Modular No</th>
<th>Mastery Mean</th>
<th>Mastery SD</th>
<th>Mastery No</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>27.75</td>
<td>4.38</td>
<td>40</td>
<td>25.78</td>
<td>4.78</td>
<td>40</td>
<td>1.90</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td></td>
<td>29.75</td>
<td>4.04</td>
<td>40</td>
<td>27.60</td>
<td>4.16</td>
<td>40</td>
<td>2.32*</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Locality</td>
<td>30.18</td>
<td>4.09</td>
<td>40</td>
<td>28.13</td>
<td>4.29</td>
<td>40</td>
<td>2.16*</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Rural</td>
<td>27.33</td>
<td>4.08</td>
<td>40</td>
<td>25.25</td>
<td>4.30</td>
<td>40</td>
<td>2.19*</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Govt.</td>
<td>27.90</td>
<td>4.47</td>
<td>40</td>
<td>25.85</td>
<td>4.75</td>
<td>40</td>
<td>1.96</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Management</td>
<td>29.60</td>
<td>4.02</td>
<td>40</td>
<td>27.53</td>
<td>4.14</td>
<td>40</td>
<td>2.24*</td>
<td>&lt; 0.05</td>
</tr>
</tbody>
</table>

* significant at 5 percent level

The result shows that in all sub groups, except among male students, there is significant difference in the achievement through Modular and Mastery Learning Strategies. In all groups, mean achievement through Modular Learning strategy is higher than that of Mastery Learning and standard deviations are around 4.5. So, among sub samples also, Modular Learning strategy is found to be more effective than Mastery Learning strategy.

5.5.3 Feasibility of implementing Modern Instructional Strategies.

Modular and Mastery Learning Strategies can be effectively implemented in an institution only if the teacher educators are having favourable attitude towards those modern instructional strategies and also, they should have adequate awareness about them. The adequacy of the facilities available in the teaching institution is also an important prerequisite for the effective implementation of Modern Instructional Strategies. Yadav (1999) found that there was positive effect of well furnished class room on teacher effectiveness.
References


