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## Construction of an Attitude Scale to Measure Attitude of MEd Students of Govt. IASE, Bikaner towards Incorporation of E-learning in Teaching-Learning Process

Himanshu Tripathi

Research Scholar (Education), Alagappa University, Karaikudi, Tamil Nadu

### ABSTRACT:

Capability to read student's psychology is one of the essential components to make teaching-learning process successful. It involves the process of becoming aware of student's attitude and aptitude. Then accordingly a competent teacher progresses in teaching-learning process to make it more effective. Attitude is an abstract quantity and difficult to measure. Various ways had been described by eminent psychologists to measure it directly or indirectly. The present study uses Thurstone method of scaling in construction of our scale for measuring student's attitude towards the subject. To make our concept clearer and to understand it at the cognitive level of understanding I tried to explain the concept with the help of an example "Construction of an attitude scale to measure attitude of MEd students of Govt. IASE, Bikaner towards incorporation of e-learning in teaching-learning process". In the scale we used 38 items showing both positive and negative effects of e-learning. Later reliability and validity of the scale was also established using split half method and through content validity method respectively. Reliability coefficient was found to be .80.

### KEYWORDS:

Attitude, Aptitude, Thurstone Scale, E-learning, Reliability, Validity.

### 1. BACKGROUND

Attitude is a pre-disposition or a tendency to respond positively or negatively towards a certain idea, object, person or situation. Attitude influences an individual's choice of action and responses to challenges, incentives and rewards. Four major components of attitude are:

- (i) Affective: emotions or feelings
  - (ii) Cognitive: belief or opinions held consciously
  - (iii) Conative: inclination for action
  - (iv) Evaluative: positive or negative response to stimuli.
- .....definition by business dictionary

Attitude is an abstract quantity and difficult to measure. Every individual is fully aware of his/her behavior, abilities and weaknesses. So it will always be better to ask someone about their thinking/ liking towards an issue. Although every one's opinion about an issue may be same / different but most of them will try to reply in a socially acceptable manner. In many situations they agree with a question or statement or an adjective when they are actually unsure of their

response. Hence, it is very difficult to measure the attitude of a person. Then also a lot of efforts had been done by various psychologists to measure attitude of a person by various means qualitatively. Thurstone and Chave (1929) developed this method of constructing attitude scale involving equal appearing intervals to measure attitude. “.....series of evenly graduated opinions so arranged that equal steps or intervals on the scale seem to most people to represent equally noticeable shifts in attitude” Thurstone (p 554). Broadly measurement can be divided into two categories:

- (i) Direct observation
- (ii) Indirect- projective techniques:
  - (a) Rorschach ink blot test
  - (b) Thematic apperception test
  - (c) Sentence completion test
  - (d) Picture arrangement
  - (e) Word association test etc.

There are various ways of constructing attitude scale. Four major types of attitude scales are:

- (i) Thurstone Scale
- (ii) Likert Scale
- (iii) Guttman Scale
- (iv) Semantic Differential scale.

## 2. OBJECTIVE:

To construct a standardised attitude scale using Thurstone Method for measuring attitude of MED students towards incorporation of e-learning in teaching-learning process.

## 3. METHODOLOGY:

### Procedure:

#### Collection of statements:

Using the method of equal appearing intervals developed by Thurstone and Chave(1929), opinions about an attitudinal object can be collected from designated samples and from related academic literature. Statements should represent the negative and positive statements toward the point of discussion.

#### Editing of Statements:

Statements so collected should be edited in such a way that present collection should contain a wide range of statements from the most negatively to the most positive statement.

#### Sorting by Judges:

The selected items are now written/ printed on a separate sheet and a number of copies are made. These copies are now distributed to judges/ experts of the field (point of discussion). Judges have to rate each statement from extremely positive to extremely negative on a eleven point scale keeping in mind that rating six is representing their neutral opinion towards the point of discussion.

### Calculation of Median and Quartile value

After sorting of statements data are tabulated to show judge's opinion about the topic. In table first column consists of statements, second the median values and last column have the quartile values. For each statement median and quartile value is calculated. Median is the value above and below which 50% of the value falls. Quartile value is given by the difference between the third and first quartile:  $Q = Q_3 - Q_1$ . To facilitate the final selection of items all median values and quartile values of each statements are arranged in the descending order of medians and ascending order of their quartile values.

### Selecting the final Scale items:

Thurstone and Chave (1929) selected the statements that are at equal intervals across the range of medians. Out of the whole statements it was tried to select the statements having highest median and lowest quartile value. The lowest quartile value shows the least amount of variability across judges.

**Example:** In the research investigator tried to construct an attitude scale using Thurstone scaling method for the measurement of MEd student's attitude towards incorporation of e-learning in teaching-learning process. Investigator started his research of constructing the scale according to the steps mentioned previously in the following way:

### Collection of Statements:

Investigator tried to collect 100 statements which seem to express various degrees of negative and positive attitudes towards topic being discussed i.e. incorporation of e-learning in teaching-learning process. Statements are obtained from:

- (i) A group of experts having knowledge of e-learning procedure and are using the mode in teaching-learning often.
- (ii) Web sites involved in teaching process through their e-content.
- (iii) Various dissertations.

### Editing of statements:

Editing of statements was supervised by Dr. Ashok Kumar Modi (Reader, Govt. IASE Bikaner). Out of 100 statements 35 were dropped as instructed by the supervisor. Later 65 statements were edited by Head of the Computer Cell of Govt. IASE Bikaner- Sh. ML Jangid (Lecturer) and Dr. Yashoda Chauhan (Reader, Govt. IASE, Bikaner). Out of the 65 statements only 38 statements were selected covering the widest possible range from the most intensely positive to the most intensely negative attitude including perceived usefulness, intention to adapt, technical and pedagogical support, evaluation and methodology and distant usefulness aspect of the topic towards the topic of discussion.

### Sorting by Judges:

The selected statements printed on a sheet were given to experts of the field having relation with e-learning. Experts were requested to sort the items on a 11 point scale. In 11 point scale-01 represents the least favourable attitude of the expert towards e-learning, point 06 neutral attitude and point 11 the most favourable attitude inclination towards the statement.

**Selecting the final scale items:**

Till now we have calculated the median and quartile value of each of the 38 statements. Now the task is to select the statements that are at equal intervals across the range of medians and quartile values. Within the value we have to try to select the statement that has the smallest quartile value and highest median value. Statement having smallest quartile value means that this statement is with the least amount of variability of opinions and highest median value showing the maximum number of experts who agree with the statements.

| Sl No. | Statements   |
|--------|--|
| 01.    | E-learning offers the possibility of efficiently managing your time.   |
| 02.    | E-learning assures schedule flexibility.   |
| 03.    | E-learning reduces student's educational cost.   |
| 04.    | E-learning will bring new opportunities for organising teaching and learning.  |
| 05.    | There are unlimited possibilities of e-learning that have yet not been thought about it.                                       |
| 06.    | E-learning will increase student's efficiency in learning.   |
| 07.    | E-learning enables collaborative learning.   |
| 08.    | E-learning can engage learners more than other forms of learning.  |
| 09.    | E-learning will replace other forms of teaching and learning.  |
| 10.    | E-learning enhances the flexibility of teaching and learning.  |
| 11.    | E-learning enhances the pedagogic value of a course.   |
| 12.    | E-learning enables forum discussion.   |
| 13.    | E-learning will enhance my effectiveness to conduct research.  |
| 14.    | E-learning will enhance my effectiveness to catch up missed lectures.  |
| 15.    | E-learning will enhance my effectiveness to submit work on time.   |
| 16.    | E-learning is as informative as teacher.   |
| 17.    | E-learning makes me uncomfortable because I do not understand it.  |
| 18.    | Students are becoming slaves to technology.  |
| 19.    | E-learning is difficult to handle and therefore frustrating to use.  |
| 20.    | It is difficult to communicate effectively with others by using e-learning.  |
| 21.    | I get stressed about slow internet connections while using e-learning.   |
| 22.    | I feel pressured by my younger peers to use e-learning.  |
| 23.    | I tend to avoid using electronic resources as I cannot effectively utilize service.  |
| 24.    | E-learning experiences cannot be equated with face-to-face learning.   |
| 25.    | E-learning increases quality of teaching and learning because it integrates all form of media: print, audio, vedio, animation. |
| 26.    | My college has got the technology needed for the delivery of e-learning.   |
| 27.    | My college has an updated website.   |
| 28.    | My college has trained professionals available to carry out e-learning training  |
| 29.    | Learning materials in the e-learning are written in a clear and understanding manner,  |
| 30.    | E-learning is a learning environment which needs advanced technical knowledge.   |

|     |   |
|-----|---|
| 31. | It is necessary that e-learning material is of high quality.                          |
| 32. | E-learning enables teachers to edit content and manage e-course activities regularly. |
| 33. | E-learning provides all the materials needed for achieving the expected results.      |
| 34. | E-learning provides ways to test knowledge through self-assessment.                   |
| 35. | Students get regular feedback about his/her work from e-course teacher.               |
| 36. | E-course teacher uses the system to communicate with students regularly.              |
| 37. | E-learning should be offered fully online to teach students living in remote areas.   |
| 38. | E-learning should be adopted to allow working students to study from office.          |

**Table-1 Statements after editing by experts**

| Judge Statement | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|-----------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 01.             | 09 | 11 | 10 | 10 | 09 | 10 | 10 | 10 | 09 | 10 | 09 | 11 | 09 | 10 | 11 | 09 | 10 | 10 | 11 | 11 |
| 02.             | 10 | 01 | 09 | 09 | 09 | 09 | 09 | 09 | 10 | 10 | 09 | 10 | 09 | 04 | 08 | 09 | 08 | 10 | 09 | 10 |
| 03.             | 11 | 06 | 07 | 11 | 10 | 02 | 10 | 11 | 08 | 09 | 09 | 10 | 07 | 04 | 07 | 09 | 08 | 09 | 10 | 10 |
| 04.             | 11 | 11 | 09 | 11 | 11 | 09 | 11 | 11 | 09 | 10 | 11 | 09 | 09 | 10 | 09 | 11 | 09 | 10 | 11 | 09 |
| 05.             | 07 | 06 | 09 | 11 | 10 | 07 | 10 | 10 | 10 | 10 | 07 | 07 | 09 | 11 | 09 | 06 | 07 | 09 | 08 | 08 |
| 06.             | 09 | 09 | 09 | 10 | 10 | 11 | 10 | 10 | 10 | 08 | 10 | 09 | 07 | 10 | 10 | 09 | 11 | 09 | 10 | 09 |
| 07.             | 06 | 05 | 07 | 09 | 09 | 10 | 09 | 09 | 08 | 05 | 09 | 08 | 07 | 09 | 10 | 09 | 09 | 07 | 05 | 07 |
| 08.             | 10 | 01 | 09 | 09 | 06 | 09 | 09 | 09 | 08 | 07 | 07 | 08 | 06 | 09 | 08 | 08 | 09 | 07 | 07 | 08 |
| 09.             | 01 | 04 | 02 | 10 | 10 | 08 | 10 | 10 | 06 | 11 | 07 | 08 | 04 | 08 | 07 | 06 | 09 | 07 | 08 | 06 |
| 10.             | 10 | 11 | 09 | 09 | 10 | 10 | 10 | 10 | 07 | 11 | 10 | 11 | 10 | 09 | 10 | 09 | 08 | 10 | 09 | 10 |
| 11.             | 09 | 10 | 02 | 10 | 09 | 10 | 09 | 09 | 09 | 09 | 10 | 09 | 08 | 09 | 10 | 07 | 09 | 06 | 09 | 10 |
| 12.             | 06 | 09 | 10 | 09 | 10 | 09 | 10 | 10 | 07 | 10 | 07 | 06 | 09 | 06 | 07 | 10 | 07 | 07 | 10 | 09 |
| 13.             | 05 | 11 | 10 | 10 | 06 | 10 | 10 | 08 | 10 | 05 | 07 | 07 | 08 | 06 | 05 | 11 | 05 | 08 | 07 | 09 |
| 14.             | 08 | 11 | 10 | 08 | 10 | 09 | 09 | 09 | 09 | 08 | 10 | 09 | 10 | 08 | 09 | 09 | 10 | 09 | 09 | 10 |
| 15.             | 11 | 11 | 07 | 10 | 09 | 10 | 09 | 09 | 10 | 11 | 09 | 10 | 07 | 08 | 10 | 09 | 10 | 09 | 08 | 09 |
| 16.             | 10 | 08 | 09 | 09 | 09 | 04 | 04 | 04 | 09 | 10 | 09 | 09 | 05 | 06 | 07 | 07 | 06 | 08 | 09 | 09 |
| 17.             | 02 | 01 | 02 | 10 | 09 | 04 | 04 | 04 | 01 | 03 | 02 | 03 | 04 | 04 | 03 | 06 | 06 | 05 | 04 | 03 |
| 18.             | 06 | 10 | 07 | 08 | 10 | 03 | 03 | 03 | 01 | 07 | 04 | 04 | 03 | 03 | 08 | 07 | 07 | 06 | 04 | 05 |
| 19.             | 05 | 04 | 07 | 11 | 07 | 05 | 05 | 05 | 01 | 06 | 06 | 05 | 07 | 06 | 05 | 07 | 11 | 04 | 05 | 05 |
| 20.             | 05 | 10 | 08 | 06 | 09 | 06 | 06 | 06 | 02 | 06 | 05 | 04 | 06 | 06 | 06 | 09 | 08 | 10 | 05 | 06 |
| 21.             | 11 | 03 | 09 | 11 | 11 | 10 | 08 | 08 | 08 | 04 | 10 | 10 | 09 | 08 | 08 | 10 | 09 | 07 | 06 | 08 |
| 22.             | 10 | 01 | 08 | 11 | 10 | 04 | 04 | 04 | 03 | 09 | 09 | 08 | 07 | 09 | 08 | 06 | 04 | 08 | 09 | 10 |
| 23.             | 04 | 02 | 07 | 08 | 06 | 03 | 03 | 03 | 04 | 05 | 03 | 07 | 06 | 03 | 03 | 07 | 08 | 02 | 04 | 04 |
| 24.             | 10 | 11 | 09 | 09 | 06 | 04 | 05 | 05 | 07 | 11 | 09 | 10 | 10 | 10 | 09 | 11 | 10 | 09 | 08 | 09 |
| 25.             | 06 | 01 | 10 | 11 | 10 | 09 | 09 | 09 | 09 | 05 | 10 | 09 | 09 | 10 | 09 | 08 | 09 | 09 | 10 | 10 |
| 26.             | 07 | 11 | 09 | 06 | 06 | 10 | 10 | 10 | 10 | 08 | 07 | 08 | 08 | 06 | 07 | 06 | 06 | 07 | 10 | 10 |
| 27.             | 05 | 01 | 01 | 01 | 06 | 08 | 08 | 08 | 09 | 06 | 03 | 04 | 03 | 09 | 08 | 08 | 06 | 01 | 01 | 06 |
| 28.             | 05 | 01 | 06 | 06 | 04 | 09 | 09 | 09 | 09 | 06 | 05 | 06 | 06 | 06 | 04 | 07 | 07 | 08 | 08 | 09 |
| 29.             | 11 | 01 | 10 | 10 | 07 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 09 | 10 | 11 | 10 | 09 | 10 | 10 | 11 |
| 30.             | 09 | 11 | 07 | 11 | 10 | 09 | 09 | 09 | 09 | 10 | 09 | 10 | 08 | 09 | 09 | 10 | 10 | 11 | 10 | 09 |



|     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 31. | 11 | 09 | 09 | 10 | 06 | 11 | 11 | 11 | 10 | 08 | 11 | 08 | 09 | 11 | 11 | 10 | 10 | 11 | 09 | 11 |
| 32. | 10 | 09 | 10 | 10 | 09 | 10 | 10 | 10 | 09 | 11 | 10 | 09 | 10 | 10 | 09 | 10 | 10 | 09 | 10 | 10 |
| 33. | 07 | 06 | 02 | 09 | 08 | 09 | 09 | 09 | 09 | 09 | 08 | 09 | 07 | 09 | 09 | 08 | 09 | 06 | 07 | 07 |
| 34. | 11 | 11 | 02 | 06 | 10 | 09 | 09 | 09 | 08 | 11 | 10 | 10 | 06 | 06 | 02 | 09 | 09 | 08 | 07 | 06 |
| 35. | 07 | 04 | 10 | 08 | 10 | 10 | 10 | 10 | 09 | 08 | 09 | 09 | 07 | 07 | 09 | 09 | 08 | 10 | 04 | 07 |
| 36. | 05 | 04 | 10 | 07 | 09 | 09 | 09 | 09 | 09 | 05 | 06 | 07 | 08 | 07 | 04 | 05 | 06 | 07 | 08 | 09 |
| 37. | 07 | 11 | 10 | 08 | 10 | 10 | 10 | 10 | 10 | 07 | 10 | 09 | 10 | 10 | 10 | 10 | 08 | 11 | 07 | 08 |
| 38. | 08 | 11 | 09 | 10 | 09 | 09 | 09 | 09 | 10 | 09 | 10 | 10 | 09 | 09 | 10 | 10 | 08 | 10 | 11 | 08 |

**Table-2 Sorting by Judges**

|                   |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |    |
|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----|
| <b>Statement</b>  | <b>29</b> | <b>06</b> | <b>10</b> | <b>32</b> | <b>01</b> | <b>04</b> | <b>31</b> | <b>37</b> | <b>02</b> | <b>11</b> | <b>14</b> | <b>15</b> | <b>25</b> | <b>30</b> | <b>38</b> | <b>03</b> | <b>07</b> | <b>21</b> | <b>24</b> |    |
| <b>Median</b>     | 10        | 10        | 10        | 10        | 10        | 10        | 10        | 10        | 09        | 09        | 09        | 09        | 09        | 09        | 09        | 09        | 09        | 09        | 09        | 09 |
| <b>Quartile V</b> | 00        | 01        | 01        | 01        | 02        | 02        | 02        | 02        | 01        | 01        | 01        | 01        | 01        | 01        | 01        | 02        | 02        | 02        | 02        | 02 |
| <b>Statement</b>  | <b>33</b> | <b>05</b> | <b>35</b> | <b>12</b> | <b>16</b> | <b>34</b> | <b>08</b> | <b>26</b> | <b>09</b> | <b>13</b> | <b>22</b> | <b>36</b> | <b>20</b> | <b>28</b> | <b>18</b> | <b>27</b> | <b>19</b> | <b>23</b> | <b>17</b> |    |
| <b>Median</b>     | 09        | 10        | 10        | 09        | 09        | 09        | 08        | 08        | 08        | 08        | 08        | 07        | 06        | 06        | 06        | 06        | 05        | 04        | 04        | 04 |
| <b>Quartile V</b> | 02        | 03        | 03        | 03        | 03        | 04        | 02        | 03        | 04        | 04        | 05        | 03        | 02        | 03        | 04        | 05        | 02        | 04        | 04        | 02 |

**Table-3 Sorting of 38 statements based on descending order of median and ascending order of quartile value**

| SI No. | Statements   |
|--------|--|
| 29.    | Learning materials in the E-learning are written in a clear and understanding manner, they are dedicately coloured and had a simple standardised form. |
| 06.    | E-learning will increase student’s efficiency in learning.   |
| 10.    | E-learning enhances the flexibility of teaching and learning.  |
| 32.    | E-learning enables teachers to edit content and manage e-course activities regularly.  |
| 01.    | E-learning offers the possibility of efficiently managing your time.   |
| 04.    | E-learning will bring new opportunities for organizing teaching and learning.  |
| 31.    | It is necessary that e-learning material is of high quality.   |
| 37.    | E-learning should be offered fully online to teach students living in remote areas.  |
| 02.    | E-learning assures schedule flexibility.   |
| 11.    | E-learning enhances the pedagogic value of a course.   |
| 14.    | E-learning will enhance my effectiveness to catch up missed lectures.  |
| 15.    | E-learning will enhance my effectiveness to submit work on time.   |
| 25.    | E-learning increases quality of teaching and learning because it integrates all form of media: print, audio, vedio and animation.                      |
| 30.    | E-learning is a learning environment which needs advanced technical knowledge.   |
| 38.    | E-learning should be adopted to allow working students to study from home.   |
| 03.    | E-learning reduces student’s educational cost.   |
| 07.    | E-learning enables collaborative learning.   |
| 21.    | I get stressed about slow internet connections while using e-learning.   |
| 24.    | E-learning experiences cannot be equated with face-to-face learning.   |
| 33.    | E-learning provides all the materials needed for achieving the expected results.   |

**Table-4 Selected final list**

20 statements so selected is our scale of measurement which is to be used on students whose attitude is to be measured. It can be applied only after verifying the reliability and validity of the scale.

**Note:** Remember in order to remove the variability among the opinions of the experts we have removed or not selected the statements having quartile value more than two.

**4. RELIABILITY:**

Reliability is an essential requirement to test validity. Test validity is the degree to which a test measures what it is designed to measure. To test the reliability of a scale there are four methods: tests retest method, alternate form, internal consistency and internal scorer reliability. Not all of these methods are used for all tests. Each method provides research evidence that the responses are consistent under certain circumstances. Here we will use the **Spearman Brown split-half method** of reliability. Split- half reliability is an internal consistency estimate. Divide whatever test we are analyzing into two halves and score them separately (usually the odd numbered items are scored separately from the even numbered items). Calculate the Pearson product-moment correlation coefficient between the student's score on the even numbered items and their scores on the odd numbered items which is given by the formula

$$r_{1/2} = \frac{\sum xy}{\sqrt{x^2 + y^2}}$$

The resulting coefficient is an estimate of the half-test reliability. Now it is applied to the whole scale item by the formula:

$$R = \frac{2r_{1/2}}{1+r_{1/2}}$$

|           |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| SI No.    | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| Statement | 29 | 06 | 10 | 32 | 01 | 04 | 31 | 37 | 02 | 11 | 14 | 15 | 25 | 30 | 38 | 03 | 07 | 21 | 24 | 33 |

| SI No. | Even Statement | Odd Statement | X    | Y    | X=(X-Mx) | y=(y-My) | X <sup>2</sup> | Y <sup>2</sup> | xy     |
|--------|----------------|---------------|------|------|----------|----------|----------------|----------------|--------|
| 01.    | 06             | 29            | 190  | 190  | 8.9      | 7.7      | 79.21          | 59.29          | 68.53  |
| 02.    | 32             | 10            | 195  | 193  | 13.9     | 10.7     | 193.21         | 114.49         | 148.73 |
| 03.    | 04             | 01            | 201  | 199  | 19.9     | 16.7     | 278.89         | 282.24         | 332.33 |
| 04.    | 37             | 31            | 186  | 197  | 4.9      | 14.7     | 24.01          | 216.09         | 72.03  |
| 05.    | 11             | 02            | 173  | 171  | -8.1     | -11.3    | 65.61          | 127.69         | 91.53  |
| 06.    | 15             | 14            | 186  | 184  | 4.9      | 1.7      | 24.01          | 2.89           | 8.33   |
| 07.    | 30             | 25            | 189  | 172  | 7.9      | -10.3    | 62.41          | 106.09         | -81.37 |
| 08.    | 03             | 38            | 167  | 188  | -14.1    | 5.7      | 198.81         | 32.49          | -80.37 |
| 09.    | 21             | 07            | 168  | 157  | -13.1    | -25.3    | 171.61         | 640.09         | 331.43 |
| 10.    | 33             | 24            | 156  | 172  | -25.1    | -10.3    | 630.01         | 106.09         | 258.53 |
|        |                |               | 1811 | 1823 |          |          | 1727.78        | 1687.45        | 1149.7 |

**Table-5 Calculation of Reliability**

Where,  
X = Total score of each even statement,

$$\begin{aligned} Y &= \text{Total score of each odd statement} \\ M_x &= \sum X/10 = 181.1 \\ M_y &= \sum Y/10 = 182.3 \\ r_{12} &= \frac{\sum xy}{\sqrt{x^2+y^2}} = \frac{1149.7}{\sqrt{1727.78+1687.45}} = 0.67 \\ R &= \frac{2r^{1/2}}{1+r^{1/2}} = \frac{1.34}{1.67} = 0.80 \end{aligned}$$

As the reliability of scale comes out to be 0.80 which is nearer to 01 and  $> 0.70$ , our scale is a reliable scale.

### 5. VALIDITY:

Only those items have been included in the scale, which were judged as relevant by the judges and the discriminative value of each item assessed through the contrasted group technique. Only highly discriminative items were retained.

Now after the reliability and validity verification of the scale we can administer the scale upon MEd students for measuring their attitude towards incorporation of e-learning in teaching-learning process.

### 6. CONCLUSION:

From the investigation it is relevant that most of the experts agreed with positive effects of e-learning incorporated in teaching-learning process. This is the reason why final selected list of frame consists of 18 positive statements and only 02 negative statements. Definitely before policing/ adopting new curriculum/ bringing in change in teaching methodology it is necessary to analyse its positive and negative/side effects. Moreover necessity is to utilise more of Thurstone Scale of attitude measurement than other scales. Only a few works had yet been done using Thurstone method.

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