BIBLIOGRAPHY


Bibliography


Lalitha, P.R. (2004). Enhancing the Relevance of Science and Technology Education: Role of Teacher Education Institutions, Perspectives in Education, Vol. 20, No. 4.


NCTE (1997). *Self-instructional modules for Teacher Education through Distance Education Mode* Document, 97/8, New Delhi.


**Internet Resources**

http://www.microsoft.com/isapi/redir.dll
http://cricir.syr.edu/plwedi-egi/fastwed
http://www.geocities.com/cttsqu/cognitive.htm
PERSONAL INFORMATION DATA

Name of the student teacher : 

Male/Female

Name of the College/University : 

Nature of the College : 
(Aided/Unaided/University College)

Qualifications : 

Optional/Subject : 
Listed below are items on self-learning materials under four categories, indicate your awareness by putting a tick (✓) mark in the appropriate box against the item concerned.

<table>
<thead>
<tr>
<th>I. SELF-LEARNING MATERIALS</th>
<th>Poor awareness</th>
<th>Low awareness</th>
<th>Average awareness</th>
<th>Good awareness</th>
<th>Very good awareness</th>
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<tbody>
<tr>
<td>1) Instructional modules</td>
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<td>2) Programmed learning</td>
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<td>3) Personalised system of instruction</td>
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<td>4) Audio-tutorial approach</td>
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<td>5) Contract activity package</td>
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<td>6) Multimedia Instructional Package</td>
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<td>7) Individually Prescribed Instruction and Plan</td>
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<td>8) Hawai English Program</td>
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<td>9) Programmed tutoring</td>
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<td>10) Computer assisted instruction</td>
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<td>11) Computer managed instruction</td>
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<td>12) Individually guided education</td>
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<td>13) Interactive video</td>
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<td>14) Self directed learning system</td>
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<td>15) Computer based education</td>
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<td>16) Work sheet</td>
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</table>

**II. CONCEPTS AND THEORIES ASSOCIATED WITH SELF-INSTRUCTIONAL MATERIALS**

1) Psychological Principles of learning

2) Educational Technology and its application in Education

3) Individualisation of instruction

4) Hardware and Software in Educational Technology

5) Learner centered educational system

6) Self instructional materials and techniques

7) Skinners operant conditioning theory

8) Linear Programmed learning material

9) Branching programmed learning techniques

10) Motivation associated with self-learning techniques

11) Pre-test, Self-test, and Post-test associated with self-learning materials

12) Formative test and Summative evaluation accompanied with self learning materials

13) Feed back and re-inforcement associated with self-learning materials
<table>
<thead>
<tr>
<th>Methods</th>
<th>Poor awareness</th>
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<th>Average awareness</th>
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<th>Very good awareness</th>
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</thead>
<tbody>
<tr>
<td>14) Basic teaching model correspond to instructional objectives/entering behaviour/instructional procedure/performance assessment</td>
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<tr>
<td>15) Computer based teaching model correspond to: Input search and evaluation/output</td>
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</tbody>
</table>

**III. FACILITIES ASSOCIATED WITH SELF-INSTRUCTIONAL METHODS**

1) Learning centers and booths where audio tapes and video cassettes are available
2) Language Laboratory
3) Home experiment kit
4) Laboratory manuals
5) Reference manuals

**IV. MATERIALS, DEVICES AND EQUIPMENTS ASSOCIATED WITH SELF-LEARNING MATERIALS**

**A Materials**
1) Slides
2) Film strips
3) Audio cassettes
4) Film
5) Video cassettes
6) Floppy disc
7) Compact disc
<table>
<thead>
<tr>
<th>B. Projection devices and equipments</th>
<th>Poor awareness</th>
<th>Low awareness</th>
<th>Average awareness</th>
<th>Good awareness</th>
<th>Very good awareness</th>
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<tbody>
<tr>
<td>1) Slide projector</td>
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<td>2) Film stip projector</td>
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<td>3) Film projector</td>
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<td>4) Episcope</td>
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<td>5) Epidiascope</td>
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<td>6) Micro projector</td>
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<td>7) OHP</td>
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<td>8) Sound synchronised slide projector</td>
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<td>9) LCD projector</td>
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<table>
<thead>
<tr>
<th>C. Non Projection devices and equipments</th>
<th>Poor awareness</th>
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<td>1) Still camera</td>
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<td>2) Record player</td>
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<td>3) Tape recorder</td>
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<td>4) Radio</td>
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</table>
Listed below are items on self-learning materials under four categories, indicate your awareness by putting a tick (✓) mark in the appropriate box against the item concerned.

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<td>4) Individualisation of instruction</td>
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<td>5) Learner centered educational system</td>
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<td>6) Self instructional materials and techniques</td>
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<td>7) Skinners operant conditioning theory</td>
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<td>8) Linear Programmed learning material</td>
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<td>9) Branching programmed learning techniques</td>
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<td>11) Feedback associated with each step in self learning materials</td>
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<td>12) Pre-test, self-test, and post-test associated with self learning materials</td>
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<td>13) Formative test and summative evaluation associated with self learning materials</td>
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<td>14) Reinforcement accompanied with self learning materials</td>
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<tr>
<td>15) Computer based teaching model correspond to; Input search and evaluation/output</td>
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**III. FACILITIES ASSOCIATED WITH SELF-INSTRUCTIONAL METHODS**

<table>
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<tr>
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<td>2) Language Laboratory</td>
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<td>3) Home experiment kit</td>
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<td>4) Laboratory manuals</td>
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<td>5) Reference manuals</td>
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<td>Poor awareness</td>
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<tr>
<td>IV. MATERIALS, DEVICES AND EQUIPMENTS ASSOCIATED WITH SELF-LEARNING MATERIALS</td>
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</tbody>
</table>

### A. Materials

1) Slides
2) Film strips
3) Audio cassettes
4) Film
5) Video cassettes
6) Floppy disc
7) Compact disc

### B. Projection devices and equipments

1) Slide projector
2) Film strip projector
3) Film projector
4) Episcope
5) Epidiascope
6) Micro projector
7) OHP
8) Sound synchronised slide projector
9) LCD projector

### C. Non Projection devices and equipments

1) Still camera
2) Record player
3) Tape recorder
4) Radio
5) Television
6) VCR
7) VCP
8) Computer
Listed below are some statements about self-learning materials and techniques. Please indicate your opinion to each of them by marking in the column which indicates your feelings best. If you strongly agree with a statement mark (✓) in column No. 1 if you agree with a statement mark (✓) in column No. 2. If you are undecided with a statement mark (✓) in column No. 3 if you disagree with a statement mark (✓) in column No. 4 and if you strongly disagree with a statement mark (✓) in column No. 5.

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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<tbody>
<tr>
<td>1</td>
<td>Self-instructional methods are learner centered methods</td>
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<tr>
<td>2</td>
<td>In self-instructional methods each student can proceed at his own speed</td>
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<td>3</td>
<td>The learners are more interested in learning through self learning materials than conventional method of teaching.</td>
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<td>4</td>
<td>The student's participation is more in self-instructional methods than in conventional method</td>
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<td>5</td>
<td>Self-learning materials cannot be correlated with day today life experiences of the learners.</td>
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<td>6</td>
<td>There is no difficulty in learning through self learning materials, because the content is divided into smaller units</td>
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<td>7</td>
<td>Self-learning materials can not be prepared for all topics</td>
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<td>8</td>
<td>Learning is made convenient for the learner in his own environment through self learning materials</td>
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<td>Strongly Agree</td>
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<td>9</td>
<td>Knowledge of computer and other devices is a must in learning through self learning materials</td>
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<td>10</td>
<td>In self instructional methods students acquire knowledge independently.</td>
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<td>11</td>
<td>Self learning materials is easy to study when organised in a systematic manner.</td>
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<td>12</td>
<td>Self instructional methods meet individual differences</td>
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<tr>
<td>13</td>
<td>Preparation of self learning materials is very easy</td>
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<tr>
<td>14</td>
<td>We do not have expert teachers and educationist to prepare self learning materials</td>
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<td>15</td>
<td>Self instructional methods is difficult to introduce because the prescribed syllabus can not be covered within the scheduled time.</td>
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<td>16</td>
<td>In distance education programme students learn through self learning materials</td>
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<td>17</td>
<td>Self learning materials is applicable for formal and non formal education</td>
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<td>18</td>
<td>Self learning materials used in one institution can be transferred to other institutions.</td>
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<td>19</td>
<td>Self instructional methods fails to appreciate the feelings of students.</td>
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<td>20</td>
<td>Self instructional methods destroys the imagination of students</td>
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<td></td>
<td>Strongly agree</td>
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<td>Undecided</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
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<td>21</td>
<td>Learning through self learning materials develop power of reasoning of students.</td>
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<td>22</td>
<td>Learning through self learning materials promotes divergent thinking</td>
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<td>23</td>
<td>Self instructional methods are more beneficial for extroverts than introverts</td>
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<td>24</td>
<td>Self instructional method develops confidence among the learners</td>
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<td>25</td>
<td>In self instructional methods the students are taught by a non-talking method</td>
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<td>26</td>
<td>By adopting self instructional methods gifted students are neglected</td>
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<td>27</td>
<td>Provides autonomy for learners in planning their learning activities</td>
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<td>28</td>
<td>Self instructional methods will create monotony for adult learners</td>
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<td>29</td>
<td>The initiation is taken by the student himself and so self learning materials will not be so effective</td>
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<td>30</td>
<td>In learning through self learning materials the learners can concentrate on their individual needs</td>
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<td>31</td>
<td>Self instructional method increases anxiety and frustration of the learners.</td>
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<td>32</td>
<td>New medias like computer and television had a great influence on students, and so self learning materials will be more effective.</td>
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<td>33</td>
<td>Even slow learners can learn through self learning materials</td>
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<tr>
<td>34</td>
<td>There is no need to work hard in learning through self learning materials</td>
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<td>35</td>
<td>By adopting self instructional methods, creativity of teachers can not be improved.</td>
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<td>36</td>
<td>Teachers help is not necessary in learning through self learning materials</td>
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<td>37</td>
<td>When self instructional materials is used the importance of the teacher is diminished.</td>
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<td>38</td>
<td>The school teachers are not trained in using self learning materials.</td>
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<td>39</td>
<td>The warmth and emotional climate which are created in direct class room interaction are absent in self instructional method</td>
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<tr>
<td>40</td>
<td>Self instructional methods create business mentality in students.</td>
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<td>41</td>
<td>In self instructional methods there is a loss of social contact</td>
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<tr>
<td>42</td>
<td>The humaneess of the teacher and the students will be diminished in learning through self learning materials</td>
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<td>43</td>
<td>There is no scope for development of values in learning through self learning materials</td>
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<td>Strongly agree</td>
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<td>44 Learning through self learning materials can not develop cooperation and group feeling among students</td>
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<td>45 The value judgemental abilities of the students can not be developed by learning through self learning materials.</td>
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</table>
Listed below are some statements about self-learning materials and techniques. Please indicate your opinion to each of them by marking in the column which indicate your feelings best. If you strongly agree with a statement mark (✓) in column No. 1 if you agree with a statement mark (✓) in column No.2. If you are undecided with a statement mark (✓) in column No.3 if you disagree with a statement mark (✓) in column No.4 and if you strongly disagree with a statement mark (✓) in column No. 5

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>The learners are more interested in learning through self-learning materials than conventional method of teaching.</td>
<td></td>
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<td>2</td>
<td>The student’s participation is more in self-instructional methods than in conventional method</td>
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<td>3</td>
<td>Self-learning materials can not be correlated with day today life experiences of the learners.</td>
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<td>4</td>
<td>Self-learning materials can be prepared for theory as well as practical aspects of learning</td>
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<td>5</td>
<td>Learning is made convenient for the learner in his own environment through self learning materials</td>
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<td>6</td>
<td>Knowledge of computer and other devices is a must in learning through self learning materials</td>
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<td>7</td>
<td>Self learning materials is easy to study when organised in a systematic manner.</td>
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<td>8</td>
<td>Self-instructional methods meet individual differences</td>
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<td>9</td>
<td>Preparation of self learning materials is very easy</td>
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<td>10</td>
<td>Self learning materials is applicable for formal and non formal education</td>
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<td>11</td>
<td>Self instructional methods fails to appreciate the feelings of students.</td>
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<td>12</td>
<td>Self instructional method destroys the imagination of students.</td>
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<td>13</td>
<td>Learning through self learning materials develop power of reasoning of students.</td>
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<td>14</td>
<td>Learning through self learning materials promotes divergent thinking</td>
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<td>15</td>
<td>Self instructional methods are more beneficial for extroverts than introverts</td>
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<td>16</td>
<td>Self instructional method develops confidence among the learners.</td>
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<td>17</td>
<td>By adopting self instructional methods gifted students are neglected.</td>
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<td>18</td>
<td>Self instructional methods will create monotony for adult learners.</td>
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<td>19</td>
<td>The initiation is taken by the student himself and so self learning materials will not be so effective.</td>
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<td>20</td>
<td>In learning through self learning materials the learners can concentrate on their individual needs.</td>
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### Questionnaire on Training, Availability and Extent of Use of Self-Instructional Materials and Devices in Teacher Education Institutions

I 1. Do you have the following self-learning materials/facilities on any teaching learning unit in School/Curriculum/B.Ed. Curriculum. Put a tick mark (✓) against the appropriate column.

<table>
<thead>
<tr>
<th>Availability</th>
<th>Curriculum</th>
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<tbody>
<tr>
<td>Yes</td>
<td>No</td>
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<tr>
<td>B.Ed Curriculum</td>
<td>School Curriculum</td>
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</tbody>
</table>

1. Programmed learning material prepared on certain units in the curriculum.
2. Instructional modules prepared on certain units in the curriculum.
4. Instructional packages containing necessary materials.
5. Audio cassettes on educational programmes.
6. Video cassettes on Educational programmes.
7. Film on educational programmes.
8. Slides on educational programmes.
I. 2. Do you have the following devices and equipments in your institution where you are doing your B.Ed. course. (Put a tick (√) mark in the appropriate column)

<table>
<thead>
<tr>
<th></th>
<th>Availability</th>
<th>Extent of use</th>
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<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>1. Still cameras</td>
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<td>2. Record player</td>
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<td>3. Tape recorder</td>
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<td>4. Radio</td>
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<td>5. Slide projector</td>
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<td>6. Film projector</td>
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<td>7. Episcope/Epidiascope</td>
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<td>8. OHP</td>
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<td>9. Television</td>
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<td>10. VCR</td>
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<td>11. VCP</td>
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<td>12. Computer</td>
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<td>Any other</td>
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</table>

II. 1. Have you prepared any self learning material during your teacher training course       Yes / No

2. Where you provide with any guidance in preparing self learning materials    Yes / No

3. Have you used any self learning material for learning certain topics in your syllabus  Yes / No

4. Do you have the opinion that student teachers should get training in preparing self learning materials.  Yes / No

5. Do you think that certain units in the B.Ed. syllabus could be learned by using self learning materials  Yes / No
III. Problem faced in using self-instructional techniques. Please indicate with a tick (✓) mark

a. Lack of Training
b. Lack of facilities
c. Lack of time
d. Lack of adequate knowledge
e. Lack of interest
f. Lack of motivation
g. Overcrowded syllabus
h. Lack of discipline in the class room
i. Lack of finance

Other reasons if any:

IV. Which of the following suggestions you think is necessary for improvement in the use of self-learning materials. Please indicate with tick mark (✓) against the valuable suggestions.

a. Provide the need training to student teachers in preparing and using self-instructional materials and devices
b. Introduce self-instructinal materials and devices in teacher training Curriculum
c. Provide every teacher education institute with modern self-instructional materials and devices.
d. Provide at least for few topics the self-learning methods
e. Provide co-operation of authorities in implementing self-instructional materials and devices
f. Other suggestion if any
Computer Assisted Instructional Material on . . .
Measurement & Evaluation - Some Significant Aspects

Prepared by : Rosamma Lukose
Supervised by : Dr. P.J. Jacob
School of Pedagogical Sciences
M.G. University, Kottayam
Unit 1

Concept Of Measurement and Evaluation
Dear Student,

Hearty welcome to the computer lessons on the topic “Measurement and Evaluation – Some Significant Aspects”. This is a programme designed for self learning purpose. In this programme you will find learning material followed by an objective type question. Study each paragraph carefully and write your response for the given question. After stating your response check them with the correct answer given in the following slide. If your answer is correct proceed to the next paragraph by clicking on the right arrow button. If your answer is wrong or you do not understand anything, again go back to the material by clicking on the left arrow button. You can take your own time to complete the package.

Objectives

After the completion of the programme, the learner will be able to.....

1. Differentiate measurement and evaluation.
2. Describe the inter relationship between objectives learning experiences and evaluation.
3. Explain the classification of objectives according to B.S. Bloom.
4. List the objectives under cognitive domain, affective domain and psychomotor domain.
5. Define tools of evaluation.
6. Discuss the characteristics of a good evaluation tool.
7. Differentiate between objectivity, validity and reliability.
1. What is measurement and how does evaluation differ from measurement? Let us take some examples,
(a) Suppose the heights of three persons A, B and C are 4ft, 5ft and 6ft respectively. This numerical data represents measurement. But when we say that person C is the tallest and A is the shortest among these three, this qualitative interpretation and value judgment about length is known as evaluation.

The qualitative interpretation and value judgment about something is known as ____________

Answer: Evaluation
b) Suppose in a particular achievement test in science five students secure 30, 40, 50, 60, and 75 percent marks respectively. We conclude that out of these five students one secured distinction, one secured first class, one got second class, one got third class and one failed on the basis of the pre-decided norms.

From these examples we may understand that measurement represents qualitative measure which does not imply any judgment concerning the value, worth or merit of the behavior being measured.

Measurement represents ________ measure which does not imply any judgment concerning the value, worth or merit of the behaviour being measured.

Answer : Quantitative
Evaluation represents qualitative interpretation which judges the value, merit or worth of one or more experiences, ideas, process etc.

Answer: Qualitative
The entire teaching learning process can be represented by a triangle as given below.

The three vertices of the triangle representing objectives, learning experiences and evaluation are the three aspects of the process of education. Which are the three aspects of the process of education?

Answer: Objectives, Learning experiences and Evaluation
Now let us see the relationship between objectives, learning experiences and evaluation. First of all objectives of teaching a particular subject are laid down in specific and well defined terms. Secondly efforts are made to achieve these objectives by providing appropriate learning experiences inside and outside the classroom. Then evaluate how far these learning experiences have proved to be fruitful in achieving the objectives. Thus the objectives determine the learning experiences and in turn influence evaluation.

The objectives, learning experiences and _________ in educational process are mutually inter-related.

Answer: Evaluation
What do you mean by an objective? An objective is a point or goal towards which an action is directed or a planned change is sought. Educational objectives provide goals towards which the curriculum is shaped; they are also the goals that provide detailed specification for construction and use of evaluation techniques. Thus objectives are pre-determined targets around which the process of teaching and evaluation revolves and which are directly connected by the expected behavioural changes brought in the students.

The pre-determined targets around which the process of teaching and evaluation revolves are called

Answer: Objectives
Objectives are divided into two parts. Educational objectives and instructional objectives. Educational objectives have the directive role to play in the process of education. Instructional objectives are those goals for the achievement of which all educational efforts are directed. In the words of B.S. Bloom by educational objectives we mean explicit formulation of the ways in which students are expected to be changed by the educative process, ie. The ways in which they will change in their thinking, their feelings and their actions.

Educational objectives and instructional objectives are the two parts of ____________

Answer: Objectives
Effective learning depends upon careful planning of learning experiences. True learning is not merely acquiring certain facts or skills. It is a change in behaviour brought about by training or experience. In any course of instruction the learning experiences changes in behaviour in terms of the established goals. The changes that the learner experiences are the direct outcome of the interaction between the learner and his environment i.e. learning situation. Learning experiences are thus pupil activities planned with the specific purpose of producing the desired behaviour changes in them.

Pupil activities planned with the specific purpose of producing the desired behaviour change in the pupils are called **Learning Experiences**.
Evaluation process in an appraisal of the changes that occur in the child as a result of learning experiences provided to them. It is a continuous process, forms an integral part of the total system of education and is intimately related to educational objectives.

An appraisal of the changes that occur in the child as a result of learning experiences is called ________

Answer: Evaluation Process
Remember

- Measurement represents quantitative measure and evaluation represents qualitative interpretation which judges the value, merit or worth of one or more experiences, ideas or processes.
- Objectives, learning experiences and evaluation are the three aspects of the process of education and they are mutually interrelated.
- Objectives are pre-determined targets around which the process of teaching and evaluation revolves.

Short Criterion test

1. Differentiate between measurement and evaluation
2. Describe the relationship between objectives, learning experiences and evaluation
3. Define educational objectives
UNIT 2

Bloom’s Taxonomy of educational Objectives
Benjamin S. Bloom and his associates classified systematically the educational objectives into three categories namely the Cognitive domain, the Affective domain and the Psychomotor domain.

Bloom classified the educational objectives into three domains. They are ___________________, ___________________, ___________________.

Answer:
1. Cognitive Domain
2. Affective domain
3. Psychomotor domain
The **Cognitive Domain** is concerned with knowing and includes activities such as remembering and recalling knowledge, thinking, problem solving, creating etc. It is in the cognitive domain that such work in curriculum development has been done. The objectives in the cognitive domain are:

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

The objectives under cognitive domain are:

**Answer:**

Knowledge, Comprehension, application, analysis, synthesis and evaluation
Now let us go through the objectives in cognitive domain.

Knowledge: Knowledge includes those behaviors and test situations which emphasise the remembering either by ‘recognition or recall’ of ideas materials and phenomena. In the words of Dr. Bloom. In the classification of the knowledge objectives the arrangement is from the specific and relatively concrete types of behaviours to the more complex and abstract ones. Thus the types of information such as names, dates, events, persons, places to processes, movements and phenomena and then to still more complex ideas such as the knowledge of universals, abstractions, theories and generalizations underlying a particular area or phenomenon.

The objective knowledge includes those behaviors and situations which emphasise the remembering by _______________ or _______________ of ideas, materials or phenomena

Answer: Recognition or Recall.
Comprehension:
Comprehension includes those objectives, behaviours or responses which represent an understanding of the literal message contained in a communication. In this sense comprehension involves an understanding of the material being communicated and also making use of the material without relating it in any way to other material.

Comprehension involves an _________ of the material being communicated.

Answer: Understanding.
Application: Application involves the use of abstractions in particular and concrete situations. The abstractions may be in the form of general ideas, rules of procedures or generalised method.

Application involves the use of ______________ in particular and concrete situations.

Answer: Abstractions
Analysis:

By analysis is meant the break down of the material into its constituent parts and detection of the relationships of the parts and of the way they are organised.

By analysis we meant the break down of the material into its ________________ parts.

Answer: Constituent
Synthesis:
Synthesis is the putting together of elements and parts so as to form a whole. This involves the process of working with pieces, parts, elements and arranging and combining them in such a way as to constitute a pattern or structure not clearly there before.

Synthesis is the ___________ of elements and parts so as to form a whole.

Answer: Putting together
Evaluation is defined as the making of the judgments about the values for some purpose of ideas, works, solutions, methods, materials etc.

Making of the judgment about the value for some purpose of ideas, works, solutions, methods, materials etc. are called______________

Answer: Evaluation
According to Bloom educational objectives can be classified under three domains, they are ________________, ________________ and ________________.

Answer:

1. Cognitive domain
2. Affective domain
3. Psychomotor domain
The affective domain is concerned with ‘feeling’. It is difficult to precisely define objectives in this domain. The objectives in this domain describe changes in interests, attitudes and values and the development of appreciations and adequate adjustments. The objectives in the affective domain are,

- Receiving (appreciation)
- Responding (Interest)
- Valuing (attitudes)
- Organizing (Value system)
- Characterization (Character formation)

The affective domain is concerned with Feeling.

Answer: Feeling.
Now we will see the objectives in the affective domain one by one.

Receiving: This is at the lowest point on the affective taxonomy. This category is defined as sensitivity to the existence of certain phenomena and stimuli. That is the willingness to receive or attend to them.

The objective receiving may be defined as the willingness to _____________ the existence of certain phenomena.

**Answer: Receive**
Responding refers to a behaviour which goes beyond merely attending to the phenomena; it implies active attending, doing something with or about the phenomena and not merely perceiving them.

Responding implies active attending, doing something with or about the _________________.

Answer: Phenomena.
Valuing: Valuing implies perceiving the phenomena as having worth and consequently revealing consistency in behaviour related to these phenomena.

Organization: Organization is defined as conceptualization of values and the employment of these concepts for determining the inter relationship among values.

The objective organization means conceptualization of _________________________.

Answer: Values.
Characterization: The organization of value internally consistent system is called characterization. It implies the organization of inter relationship among various values into a total philosophy of world view.

The organization of value internally consistent system is called _________________.

Answer: Characterization.
The objectives in affective domain are

1. Receiving
2. Responding
3. Valuing
4. Organizing
5. Characterisation

Answer:

1) Receiving 2) Responding 3) Valuing 4) Organizing 5) Characterisation
The psychomotor domain is the domain of ‘doing’ the manipulation or motor skill area. Presumably it deals with areas involving varied type of muscular skill and coordinations such as those involved in mechanical work, physical training, surgery, clerical trades etc. According to Dave, the objectives in the psychomotor domain are,

- Imitation
- Manipulation
- Precision (Control)
- Articulation (Co-ordination)
- Naturalisation (Habit formation)

The Psychomotor domain is the domain of ______

Answer: Doing
Now let us see the objectives under psychomotor domain

**Imitation**: Imitation involves the ability of the learner to perform an act according to given instructions, but often lacks any sustained control. Eg: Perform actions which are impulsive and imperfect.

The ability of the learner to perform an act according to given instructions are often referred to as ____________.

**Answer: Imitation.**
Manipulation: Manipulation means the learner is able to perform an act according to given instructions rather than doing an observation on initiation pattern. Eg:- following directions, performing actions and practicing actions etc.

Precision (Control): Precision refers to the ability of the learner to practice and to perform components of complex task. Errors are minimized with practice. Eg:- reproducing action with control, accuracy and exactness.

The ability of the learner to practice and to perform components of complex task is referred to as ____________________________

Answer: Precision (Control)
Articulation (Co-ordination) :
Articulation refers to the ability of the learner to co-ordinate a series of facts by establishing sequence and harmony. Eg :- performs with accuracy, control, speed and time.

The ability of the learner to perform an act with accuracy, control, speed and time is referred to as ________________.

Answer: Articulation (Co-ordination)
Naturalisation: It refers to the ability of the learner to perform automatically and spontaneously.

Eg: - performance becomes routinised, natural and smooth.
The ability of the learner to perform an act automatically and spontaneously is referred to as _________________.

Answer: Naturalisation.
Remember:

- Benjamin S. Bloom classified educational objectives into three domains namely the cognitive domain, the affective domain and the psychomotor domain.
- The cognitive is concerned with ‘Knowing’, affective is concerned with feeling and psychomotor is concerned with ‘doing’.
- The objectives in the three domains are,

<table>
<thead>
<tr>
<th>Cognitive domain</th>
<th>Affective domain</th>
<th>Psychomotor domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Receiving (appreciation)</td>
<td>Imitation</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Responding (interest)</td>
<td>Manipulation</td>
</tr>
<tr>
<td>Application</td>
<td>Valuing (attitudes)</td>
<td>Precision (Control)</td>
</tr>
<tr>
<td>Analysis</td>
<td>Organising (value System)</td>
<td>Articulation (Coordination)</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Characterization (character formation)</td>
<td>Naturalization (Habit formation)</td>
</tr>
</tbody>
</table>
UNIT 3

Tools of Evaluation
A tool may be defined as an instrument or implement that facilitates the work of the hand and the eye. A tool of evaluation as used in education is a device or technique that will facilitate the process of measuring and recording the characteristics of pupils. Tools of evaluation are sophisticated techniques of appraisal, intelligently designed to measure what is required to be measured. Modern evaluation uses a variety of techniques of appraisal such as achievement, attitude, personality and character tests, rating scales, questionnaires, judgment scales of products, interviews, controlled observation techniques, sociometric technique and anecdotal records (J. W. Wrightstone)

The techniques of appraisal designed to measure what is required to be measured is called _______ _________.

**Answer: Tools of evaluation**
Now we will see the commonly used evaluation tools.

Tests: Test is the most popular tool used for collecting data for evaluation. Tests can be of two types.

a) Standardised tests (Psychological tests)
Eg: - personality, Intelligence, attitude, aptitude etc.

b) Non standardised tests (Teacher made tests)

An intelligence test is an example for ___________________.

Answer:
Standardized tests/psychological tests
The most common teacher made tests can be broadly divided into three categories.

1) **Written tests**  
2) **Oral tests**  
3) **Practical tests.**

**Written Test:**
In written tests the respondent has to respond in written form. In these type of tests a question paper is provided to the respondent to respond either in the same paper or in the answer sheet provided for the purpose of answering.

**Oral Tests:**
In oral tests the examiner asks questions for which the respondent respond orally.

**Practical tests:**
In practical tests, the examinees are required to do exercise using objects or apparatus given to them.

Written tests, oral tests and practical tests are the three categories of ___________________.

**Answer:** Teacher-made tests
Questionnaires:
A Questionnaire is a useful tool of evaluation. A large amount of data on various aspects of the theme in hand can be collected and the respondent can be evaluated accordingly. The information collected with the help of a questionnaire may be used for evaluating personality traits, interests, opinions, likes and dislikes. The tool which is used when a large amount of data collected is ___________.

Answer: Questionnaire.
Observation:
Observation is a tool by which the external behaviour of a person/persons in controlled or uncontrolled situations can be observed and recorded. Observation is an attempt to observe and appraise whatever happens as it happens. The two commonly used methods of observation are
1) Directed observation and 2) The anecdotal method.
The directed observation procedure is directed towards a particular pupil or pupil group under controlled condition. The anecdotal method make use of classroom situation and evaluation is done on the basis of results obtained from observation of pupil behaviour at a time.

Answer: Observation.
Checklist:
Checklist is something like a two dimensional chart in which the traits measured are noted in one dimension and the names of the examinees in the other.

Rating scale:
Rating scale resembles checklist but when finer discrimination is required, rating scales should be used instead of checklist because checklist record only the presence or absence of certain traits or characteristics and happening or not of a particular event while rating scale add how much or how well it happened i.e. the degree to which a particular trait is present which can be evaluated with the help of rating scale. Thus rating scales are improved devices in comparison to checklists.

The degree of the presence of a particular trait may be rated quantitatively as always, sometimes, never and qualitatively as good, average, poor. These can also be quantified by assigning numbers from 1 to 5.

The degree to which a particular trait is present may be evaluated by using __________________.
Anecdotal records: This is used for the recording of the specific incidents, factual description of meaningful events or behaviours of the students as observed by the teacher from time to time. Anecdotal records include both the objective description of behaviour and an interpretation of it. The incident recorded should be significant throwing light on some aspect of student’s personality.

Interview Schedule: Interview schedule is used for collecting the data from an individual directly by face to face personal conversation with some specific purpose. By gestures, voice and mode of expressions much can be observed and recorded.

- Interview is used for collecting the data from an individual by face to face personal conversation.
Answer: Interview.

Remember:

- Tools of evaluation are techniques of appraisal designed to measure what is required to be measured.
- Tests, questionnaire, observation, checklist, rating scale, anecdotal records, interview etc. are some of the commonly used evaluation tools.
UNIT 4
Characteristics of a Good Evaluation Tool
Now let us see what are the characteristics or qualities of a measuring instrument. For a good measuring instrument, the following qualities are essential

1) Validity  2) Reliability  3) Objectivity  and 4) Practicability

Validity, reliability, objectivity and practicability are the __________ of a good measuring instrument.

Answer: characteristics
Validity of a test refers to the test's quality to measure what it is intended to measure. In the words of Gate's, "A test is valid when it measures truly and accurately the ability or quality one wants to appraise". Thus validity means truthfulness of the test. Validity is a specific rather than a general criterion of a good test. It is specific in the sense that a test may be highly valid for use in one situation and highly invalid for use in another manner. It may be valid for use with one group of pupils but not for use with a different group of pupils.

When a test measures what it is intended to measure, then that test will be ________________.

Answer: Valid.
There are different types of validity. The important among them are 1) Face validity 2) Content Validity 3) Factorial validity (construct validity) 4) Predictive validity 5) Concurrent validity

Face validity means the given test appears or seems to measure what it is to measure. This validity refers to what the test seems to measure.

Face validity refers to what the test seems to __________.
Content validity is considered in relation to achievement tests. An achievement test has content validity if it represents faithfully the objectives of a given instructional sequence and reflects the emphasis accorded to these objectives as the instruction was carried out. Thus content validity is determined by the fact that it adequately covers both the content and objectives of the subject matter unit on which the test is based.

Content validity is considered in relation to _____.

Answer: Achievement tests.
Construct validity of a test refers to the extent to which the test measures a particular characteristic of the individual. Predictive validity determines the future success of the test. The predictive validity of a test is determined on the basis of an established criterion. Tests are said to have concurrent validity when they can distinguish between two or more groups of individuals whose status at the time of testing different.

The extent to which the test measures a particular characteristic of the individual is termed as __________ validity.

Answer: Construct validity.
Reliability is the consistency of a test, yielding the same results in measuring whatever it does measure. According to Anastasi (1998) "The reliability of a test refers to the consistency of score obtained by the same individual on different occasions or with different sets of equivalent items.

Reliability is the __________ of a test, yielding the same results in measuring whatever it does measure.

Answer: Consistency.
Reliability depends on three factors:
1) The length of the test: A longer test is more reliable than a shorter one.
2) Objectivity in Scoring: A test which can be objectively scored can yield more reliable results than otherwise.
3) Clarity of instructions: If the instructions are ambiguous, different pupils are likely to interpret them differently and hence different answers. Consequently the score obtained cannot be said to be reliable.

The factors on which the reliability depends upon are 1) 2) 3)

Answer:
1) Length of the test. 2) Objectivity in scoring. 3) Clarity of instructions.
A test is **objective** when it makes for the elimination of the scorer’s personal opinion, bias or judgment. Objectivity is closely related with reliability. Objectivity can be expressed in terms of the coefficient of objectivity.

The following statement is true or false. Objectivity of a test means it has no impact of personal traits, opinion, bias or judgment.

**Answer: True**
Practicability relates to the practical aspects of the test in respect of administration, scoring, and economy. Practicability is the degree to which the test or other measuring instrument can be successfully employed by classroom teachers and school administrators without an unnecessary expenditure of time and energy. Practicability of a test depends upon the following factors:

1) Ease of administration
2) Ease of scoring
3) Ease of interpretation
4) Economy of cost, time, and energy.

Which of the following is not related to the practicability of a test:

- Ease of administration
- Ease of scoring
- Ease of transference
- Ease of interpretation
- Economy of cost, time, and energy.

Answer: Ease of transference.
Remember:

- The characteristics of a good evaluation tool are validity, reliability, objectivity and practicability.
- There are five types of validity:
  - **Face Validity**
  - **Content Validity**
  - **Factorial Validity**
  - **Predictive Validity**
  - **Concurrent Validity**

- The reliability of a test refers to the consistency of score obtained by the same individual on different occasions or with different sets of equivalent items.
- Objectivity of a test means it has no impact of personal traits, opinion bias or judgment.
- Practicability of a test relates to the practical aspects of the test in respect of administration, scoring and economy.

Short Criterion test

Describe the characteristics of a good evaluation tool.
The End
Dear Student,

This is a module prepared for the topic “Measurement and Evaluation - Some Significant aspects”. It is prepared for Self-Study. There are 4 subunits in this module. Read each one carefully and try to answer the questions given at the end of each unit. Verify your answer with the key given.

General Objectives:

After the completion of the programme, the learner will be able to;

1. Differentiate measurement and evaluation
2. Describe the inter relationship between objectives, learning experiences and evaluation.
3. Explain the classification of objectives according to B.S. Bloom
4. List the objectives under cognitive domain, affective domain and psychomotor domain.
5. Define tools of evaluation
6. Describe the characteristics of a good evaluation tool
7. Differentiate between objectivity, validity and reliability.
UNIT - I
Concept of Measurement and Evaluation

Specific objectives:

The learner will be able to; realise the concept of measurement and evaluation

Differentiate between measurement and evaluation

Describe the inter relationship between objectives, learning experiences and evaluation.

Study Material

What is the difference between measurement and evaluation? Suppose the heights of three persons A, B and C are 4 ft, 5ft and 6ft respectively. This numerical data represents measurement. Here the person C is the tallest and A is the shortest among these three. This qualitative interpretation and value judgement about length is the evaluation.

Take another example. In a particular achievement test in science five students secure 30, 40, 50, 60 and 70 percent marks respectively. We may say that out of these five students one secured distinction, one secured first class, one got second class, one got third class and one failed on the basis of the pre-decided norms.

Conclusion

Measurement represents quantitative measure and evaluation represents qualitative interpretation, which judges the value, merits or worth of one or more experiences, ideas or processes.
What is measurement?

What is evaluation?

Now we will see the various aspects of the process of education. In an educational process first of all objectives of teaching a particular subject are to be laid down in specific and well defined terms. Secondly efforts are to be made inorder to achieve these objectives by providing appropriate learning experiences inside and outside the class room. Then evaluate how far these learning experiences have proved to be fruitful in achieving the objectives. This can be represented by a triangle.

Conclusions

Objectives, learning experiences and evaluation are the three aspects of the process of education. The objectives, learning experiences and evaluation are mutually inter-related and can be represented in the form of a triangle.

Which are the three aspects of the process of education?

What do we mean by an objective? An objective is a point or goal towards which an action is directed or a planned change is sought. Educational objectives provide goals towards which the curriculum is shaped, they are also the goals that provide detailed specification for construction and use of evaluative techniques. Thus objectives are pre-determined targets around which the process of teaching and evaluation revolves and which are directly conencted by the expected behavioural changes brought in the students.
Objectives are the pre-determined target around which the process of teaching and evaluation revolves.

What are instructional objectives?

Effective teaching depends upon careful planning of learning experiences. True learning is not merely acquiring certain facts or skills. It is a change in behaviour brought about by training or experience. In any course of instruction the learning experiences changes in behaviours in terms of the established goals. The changes that the learner experiences are the direct outcome of the interaction between the learner and his environment. Learning experiences are thus pupil activities planned with the specific purpose of producing the desired behaviour changes in them.

Evaluation process is an appraisal of the changes that occur in the child as a result of learning experiences provided to them. It is a continuous process, forms an integral part of the total system of education and is intimately related to educational objectives.

Learning experiences are pupil activities planned with the specific purpose of producing the desired behaviour change in the pupils. Evaluation process is an appraisal of the changes that occur in the child as a result of learning experiences.
Self Check

1. Measurement is quantitative and Evaluation is ______________ interpretation of experiences ideas or process.

2. The three aspects of the process of education are
   
   1) ________________
   
   2) ________________
   
   3) ________________

3. The pre-determined targets around which the process of teaching and evaluation revolves are called, ________________
UNIT - II
Blooms Taxonomy of Educational Objectives

Specific Objectives

The learner will be able to;

Classify objectives according to Bloom’s Taxonomy

List out the objectives under cognitive domain, affective domain and psychomotor domain,

Realises the behavioural changes associated with various objectives.

Study Material

How do we classify educational objectives?

Benjamin S Bloom and his associates classified systematically the educational objectives into three categories, namely the cognitive domain, the affective domain and the psychomotor domain.

The **cognitive domain** is concerned with knowing and includes activities such as remembering and recalling knowledge, thinking, problem solving, creating etc. It is in the cognitive domain that such work in curriculum development has been done. The objectives in the cognitive domain are

```
Knowledge
  ↓
Comprehension
  ↓
Application
  ↓
Analysis
  ↓
Synthesis
  ↓
Evaluation
```
Which are the objectives under cognitive domain?

Now let us go through the objectives in cognitive domain.

**Knowledge**

Knowledge includes those behaviours and test situations which emphasise the remembering either by recognition or recall of ideas, materials or phenomena. In the classification of the knowledge objectives the arrangement is from the specific and relatively concrete types of behaviour to the more complex and abstract ones. Thus the types of information such as names, dates, events, persons, places to process, movements and phenomena and then to still more complex ideas such as the knowledge of universals, abstractions, theories and generalisations underlying a particular area or phenomenon.

**Comprehension**

Comprehension includes those objectives, behaviours or responses which represent an understanding of the literal message contained in a communication. In this sense comprehension involves an understanding of the material being communicated and also making use of the material without relating it in anyway to other material.

**Application**

Application involves the use of abstractions in particular and concrete situations. The abstractions may be in the form of general ideas, rules of procedures or generalised method.
Analysis

Analysis is the breakdown of the material into its constituent parts and detection of the relationships of the parts and of the way they are organised.

Synthesis

Synthesis is the putting together of elements and parts so as to form a whole. This involves the process of working with pieces, parts, elements and arranging and combining them in such a way as to constitute a pattern or structure not clearly thereof.

Evaluation

Evaluation is the making of the judgements about the value for some purpose of ideas, works, solutions, methods, materials etc.

Conclusions

Bloom classified the educational objectives under three domains. They are, cognitive domain, affective domain and psychomotor domain and this is known as Blooms taxonomy of educational objectives. The objectives under cognitive domain are knowledge, comprehension, application, analysis, synthesis and evaluation.

The affective domain is concerned with ‘feeling’. The objectives in this domain describe changes in interest, attitudes, values, development of appreciations and adequate adjustment. The objectives in the affective domain are,
Which are the objectives under affective domain?

Now let us see the objectives one by one:

**Receiving**

This is at the lowest point on the affective taxonomy. This category is defined as sensitivity to the existence of certain phenomena and stimuli that is, the willingness to receive or attend to them.

**Responding**

Responding refers to a behaviour which goes beyond merely attending to the phenomena; it implies active attending, doing something with or about the phenomena and not merely perceiving them.

**Valuing**

Valuing implies perceiving them as having worth and consequently revealing consistency in behaviour related to these phenomena.

**Organization**

Organization is defined as conceptualization of values and the employment of these concepts for determining the interrelationship among values.
Characterization

The organization of value internally consistent system is called characterization. It implies the organization of interrelationship among various values into a total philosophy of world view.

Conclusion

The affective domain is concerned with feeling and the objectives in this domain describe changes in interest, attitudes, values and the development of appreciation.

The objectives in the affective domain are Receiving (appreciation), Responding (interest), valuing (attitudes), organising (value system) and Characterization (Character formation).

The psychomotor domain is the domain of ‘doing’ the manipulation or motor skill area. Presumably it deals with areas involving varied types of muscular skill and co-ordinations such as those involved in mechanical work, physical training surgery, electrical trades etc. According to Dave, the objectives in the psychomotor domain are

Now we will discuss the objectives one by one.
Imitation

Imitation involves the ability of the learner to perform an act according to given instructions, but often lacks any sustained control. That means perform actions which are impulsive and imperfect.

Manipulation

Manipulation means the learner is able to perform an act according to given instructions rather than doing an observation on initiation pattern.

For example, following directions, performing actions and practising actions etc.

Precision (Control)

Precision refers to the ability of the learner to practice and to perform components of complex task. Errors are minimized with practice.

For example, Reproducing action with control, accuracy and exactness

Articulation (Co-ordination)

Articulation refers to the ability of the learner to co-ordinate a series of facts by establishing sequence and harmony.

For example: Performs with accuracy, control, speed and time.

Naturalisation (Habit formation)

Naturalisation refers to the ability of the learner to perform automatically and spontaneously. For example; performance become routinised, natural and smooth.
Self Check

1) Which are the three domains of educational objectives according to Dr. B.S. Bloom?

2) The cognitive domain is concerned with _____.

3) The ability of the learner to use abstractions in particular and concrete situations is the objective _____.

4) List out the objectives under affective domain
Specific objectives:

The learner will be able to:

1. define tools of evaluation
2. identify various tools and their application in evaluation process.
3. construct various tools for evaluation.

Study material

What do you know about tools of evaluation? A tool may be defined as an instrument or implement that facilitates the work of the hand and the eye. A tool of evaluation as used in education is a device or technique that will facilitate the process of measuring and recording the characteristics of pupils. Tools of evaluation are sophisticated techniques of appraisal, intelligently designed to measure what is required to be measured. Modern evaluation uses a variety of techniques of appraisal such as achievement, attitude, personality and character tests, rating scales, questionnaires, judgement scales of products, interviews, controlled observation techniques, sociometric technique and anecdotal records. (J.W. Wrightstone).

Now we will discuss the commonly used evaluation tools.

Tests

Test is the most popular tool used for collecting data for evaluation. Tests can be of two types.

a) Standardised tests (Psychological tests)
   eg: Personality, intelligence, attitude, aptitude etc
b) Non standardised tests (Teacher made tests)

The most common teacher-made tests can be broadly divided into three categories.

**Written test**

In written tests the respondent has to respond in written form. In these type of tests a question paper is provided to the respondent to respond either in the same paper or in the answer sheet provided for the purpose of answering.

**Oral Tests**

In oral tests the examiner asks questions for which the respondent responds orally.

**Practical test**

In practical tests the examiners are required to do exercise using objects or apparatus given to them.

**Questionnaires**

A questionnaire is a useful tool of evaluation. A large amount of data on various aspects of the theme in hand can be collected and the respondent can be evaluated accordingly. The information collected with the help of a questionnaire may be used for evaluating personality traits, interests, opinions, likes and dislikes.

**Observation**

Observation is a tool by which the external behaviour of a person/persons in controlled or uncontrolled situations can be observed and recorded.
Observation is an attempt to observe and appraise whatever happens. The two commonly used methods of observation are

a) the directed observation and

b) the anecdotal method

The directed observation procedure is directed towards a particular pupil or pupil group under controlled condition. The anecdotal method make use of class room situations and evaluation is done on the basis of results obtained from observation of pupil behaviour at a time.

Check list

Check list is something like a two dimensional chart in which the traits measured are noted in one dimension and the names of the examinees in the other.

A typical example of the check list is,

Rating Scale

Rating scale resembles checklist but when finer discrimination is required, rating scales should be used instead of checklists because check list record only the presence or absence of certain traits or characteristics and happening or not of a particular event while rating scales add how much or how well it happened. ie the degree to which a particular trait is present which can be evaluated with the help of a rating scale. Thus rating scales are improved devices in comparison to check list.

The degree of the presence of a particular trait may be rated quantitatively as always, sometimes, never and qualitatively as good, average, poor. These can also be quantified by assigning numbers from 1 to 5.
Anecdotal records

This device is used for recording of the specific incidents, factual description of meaningful events or behaviours of the students as observed by the teacher from time to time. Anecdotal records include both the objective description of behaviour and an interpretation of it.

Self-Check.

1. Techniques of appraisal designed to measure what is required to be measured is called ________________

2. The degree to which a particular trait is present may be evaluated by using ________________

3. List out the commonly used evaluation tools.
UNIT - IV
Characteristics of a good Evaluation Tool

Specific Objectives

The learner will be able to;

1. describe the characteristics of a good evaluation tool
2. distinguish between validity, reliability, objectivity and practicability of a test.
3. establish validity, reliability, objectivity and practicability of evaluation tools.

Study material

Let us see what are the characteristics or qualities of a good measuring instrument. Validity, reliability, objectivity and practicability are the characteristics of a good measuring instrument.

Validity

Validity of a test refers to the test’s quality to measure what it is intended to measure. In the words of Gate’s “A test is valid when it measures truly and accurately the ability or quality one wants to appraise.” Thus validity means truthfulness of the test. Validity is a specific rather than a general criterion of a good test. It is specific in the sense that a test may be highly valid for use in one situation and highly invalid for use in another manner. It may be valid for use with one group of pupils but not for use with a different group of pupils.
There are different types of validity. The important among them are

1. Face Validity
2. Content Validity
3. Factorial validity (Construct validity)
4. Predictive validity
5. Concurrent validity

Face validity means the given test appears or seems to measure what it is to measure. This validity refers to what the test seems to measure.

Content validity is considered in relation to achievement tests. An achievement test has content validity if it represents faithfully the objectives of a given instructional sequence and reflects the emphasis accorded to these objectives as the instruction was carried out. Thus content validity is determined by the fact that it adequately covers both the content and objectives of the subject matter unit on which the test is based.

Construct validity of a test refers to the extent to which the test measures a particular characteristic of the individual. Predictive validity determines the future success of the test. The predictive validity of a test is determined on the basis of an established criterion. Tests are said to have concurrent validity when they can distinguish between two or more groups of individuals whose status at the time of testing is different.

**Reliability**

Reliability is the consistency of a test yielding the same results in measuring whatever it does measure. According to Anastasi (1998) "The
reliability of a test refers to the consistency of score obtained by the same individual on different occasions or with different sets of equivalent items.

Reliability depends upon three factors

1. The length of the test: a longer test is more reliable than a shorter one.

2. Objectivity in scoring: a test which can be objectively scored can yield more reliable results than otherwise.

3. Clarity of instructions: if the instructions are ambiguous, different pupils are likely to interpret them differently and hence different answers. Consequently the score obtained cannot be said to be reliable.

Objectivity

A test is objective when it makes for the elimination of the scorer’s personal opinion, bias, or judgement. Objectivity is closely related with reliability. Objectivity can be expressed in terms of coefficient of objectivity.

Practicability

Practicability relates to the practical aspects of the test in respect of administration, scoring and economy. Practicability is the degree to which the test or other measuring instrument can be successfully employed by classroom teachers and school administrators without an unnecessary expenditure of time and energy. Practicability of a test depends upon the following factors.
1. ease of administration
2. ease of scoring
3. ease of interpretation
4. economy of cost, time and energy

Self-check

1. Validity, reliability objectively and practicability are the __________ of a good evaluation tool

2. Reliability is the ______________ of a test, yielding the same result in measuring whatever it does measure.

3. ________________refers to the test’s quality to measure what it is intended to measure.
ANSWER KEY

Unit I
1. Qualitative
2. 1) Objectives  2) Learning experiences  3) Evaluation
3. Objectives

Unit 2
1. Cognitive domain, Affective domain and Psychomotor domain
2. Knowing
3. Application
4. Perception, Impulsion, Manipulation, Control, Co-ordination, and Naturalisation.

Unit 3
1. Tools of evaluation
2. Rating scale
3. Achievement test, Questionnaire, Observation, Check list, Rating scale, Anecdotal records.

Unit 4
1. Characteristics
2. Consistency
3. Validity

*****
Multimedia Package on Measurement and Evaluation – Some Significant Aspects

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UNIT 1

Concept of Measurement and Evaluation

- What is measurement?
- What is the difference between measurement and Evaluation.

<table>
<thead>
<tr>
<th>Person A</th>
<th>Person B</th>
<th>Person C</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 ft.</td>
<td>5 ft.</td>
<td>6 ft.</td>
</tr>
</tbody>
</table>
Measurement represents quantitative measure which does not imply any judgement concerning the value, worth or merit of the behaviour being measured. Evaluation is the qualitative interpretation which judges the value, merit or worth of one or more experiences, ideas, process etc.
The objectives, learning experiences and evaluation in Educational process are mutually inter-related.

The Pre-determined targets around which the process of teaching and evaluation revolves are called objectives.
Objectives

Educational objectives

Instructional objectives

Instructional objectives are those goals for the achievement of which all educational efforts are directed.

According to B.S. Bloom by educational objectives we mean explicit formulation of the ways in which students are expected to be changed by the educative process.

Learning experiences are pupil activities planned with the specific purpose of producing the desired behaviour change in the pupils.
Evaluation process is an appraisal of the changes that occur in the child as a result of learning experiences provided to them.
UNIT 2

Bloom’s Taxonomy of Educational Objectives

Educational Objectives

- Cognitive domain
- Affective domain
- Psychomotor domain
Cognitive Domain

Knowledge
  Æ Comprehension
    Æ Application
      Æ Analysis
        Æ Synthesis
          Æ Evaluation

The objective knowledge include those behaviours and situations which emphasise the remembering by 'recognition or recall'.
Comprehension involves an understanding of the material being communicated.

Application involves the use of abstractions in particular and concrete situations.
Analysis is the breakdown of the material into its constituent parts

Synthesis is the putting together of elements and parts so as to form a whole
Evaluation is the making of the judgement about the value for some purpose of ideas, works, solutions, methods, materials, etc.

Affective domain

- Receiving (appreciation)
- Responding (interest)
- Valuing (attitude)
- Organizing (value system)
- Characterization (character formation)
The objective receiving may be defined as the willingness to receive or attend to the existence of certain phenomena.

Responding implies active attending, doing something with or about the phenomena.
Valuing implies perceiving the phenomena as having worth, and organization means conceptualization of values.

Organization is the conceptualization of values and the employment of these concepts for determining the interrelationship among values.
The organization of value internally consistent system is called characterization.

Psychomotor domain

- Imitation
- Manipulation
- Precision (Control)
- Articulation (Co-ordination)
- Naturalisation (Habit formation)
Imitation is the ability of the learner to perform an act according to the given instructions.

Manipulation means the learner is able to perform an act according to given instructions rather than doing an observation on initiation pattern. Precision refers to the ability of the learner to practice and to perform components of complex task.
Co-ordination or articulation is the ability of the learner to co-ordinate a series of facts by establishing sequence and harmony.

Naturalization refers to the ability of the learner to perform automatically and spontaneously.
UNIT 3

TOOLS OF EVALUATION

The techniques of appraisal designed to measure what is required to be measured is called tools of evaluation.
Achievement tests, attitude, personality and character tests, rating scales, questionnaires, judgement scales of products, interviews, controlled observation techniques, sociometric technique and anecdotal records are some of the tools of evaluation.

Tests

- Standardised tests
  - (Psychological tests)
  - Eg: personality, intelligence, attitude, aptitude etc.

- Non-Standardised tests (Teacher made tests)
The questionnaire is a tool which is used when a large amount of data is collected.
The observation is a tool by which the external behaviour of a person in controlled or uncontrolled situations can be observed and recorded.

The tool check list is something like a two dimensional chart in which the traits measured and the names of the examinees are noted. The tool rating scale resembles check list. But when finer discrimination is required, rating scales should be used instead of check lists.
Anecdotal record is used for recording of the specific incidents, factual description of meaningful events or behaviours of the students as observed by the teacher from time to time.

Interview schedule is used for collecting the data from an individual by face to face personal conversation.
UNIT – 4

Characteristics of a good Evaluation Tool

Validity, Reliability, Objectivity and Practicability are the characteristics of a good measuring instrument
When a test measures what it is intended to measure then that test will be valid.
Face validity refers to what the test seems to measure.

Content validity is considered in relation to achievement test.

The extend to which the test measures a particular characteristic of the individual is termed as construct validity.

Predictive validity determines the future success of the test.

Tests have concurrent validity when they distinguish between two or more groups of individuals whose status at the time of testing different.
Reliability is the consistency of a test, yielding the same results in measuring whatever it does measure.

✓ Reliability depends upon the factors like length of the test, objectivity in scoring and clarity of instructions.
Objectivity of a test means it has no impact of personal traits, opinion, bias or judgement.

Practicability of a test relates to the practical aspects of the test in respect of administration, scoring and economy. Thus practicability depend upon. 1) Ease of administration 2) Ease of scoring 3) Ease of interpretation and 4) Economy of cost, time and energy.
The End
Dear Student,

This is a ‘Study Manual’ for the multimedia package prepared on the topic “Measurement and Evaluation - Some Significant aspects.” It is prepared as a support for Self-Study. There are 4 sub units. Read each one carefully and with the help of given package try to answer the questions given at the end of each unit. Verify your answer with the key given.

General Objectives:

After the completion of the programme, the learner will be able to;

1. Differentiate measurement and evaluation

2. Describe the inter relationship between objectives, learning experiences and evaluation.

3. Explain the classification of objectives according to B.S.Bloom

4. List the objectives under cognitive domain, affective domain and psychomotor domain.

5. Define tools of evaluation

6. Describe the characteristics of a good evaluation tool

7. Differentiate between objectivity, validity and reliability.
UNIT - I

Concept of Measurement and Evaluation

Measurement represents quantitative measure and evaluation represents qualitative interpretation, which judges the value, merits or worth of one or more experiences, ideas or processes.

Now we will see the various aspects of the process of education. In an educational process first of all objectives of teaching a particular subject are to be laid down in specific and well defined terms. Secondly efforts are to be made in order to achieve these objectives by providing appropriate learning experiences inside and outside the classroom. Then evaluate how far these learning experiences have proved to be fruitful in achieving the objectives. This can be represented by a triangle.

What do we mean by an objective? An objective is a point or goal towards which an action is directed or a planned change is sought. Educational objectives provide goals towards which the curriculum is shaped, they are also the goals that provide detailed specification for construction and use of evaluative techniques. Thus objectives are pre-determined targets around which the process of teaching and evaluation revolves and which are directly connected by the expected behavioural changes brought in the students.
Effective teaching depends upon careful planning of learning experiences. True learning is not merely acquiring certain facts or skills. It is a change in behavir brought about by training or experience. In any course of instruction the learning experiences changes in behaviours in terms of the established goals. The changes that the learner experiences are the direct outcome of the interaction between the learner and his environment. ie learning situation. Learning experiences are thus pupil activities planned with the specific purpose of producing the desired behaviour changes in them.

Evaluation process is an appraisal of the changes that occur in the child as a result of learning experiences provided to them. It is a continuous process, forms an integral part of the total system of education and is intimately related to educational objectives.

Self Check

1. Measurement is quantitative and Evaluation is ____________ interpretation of experiences ideas or process.

2. The three aspects of the process of education are

   1) ___________________  2) ___________________  3) ___________________

3. The pre-determined targets around which the process of teaching and evaluation revolves are called, ____________
Benjamin S Bloom and his associates classified systematically the educational objectives into three categories, namely the cognitive domain, the affective domain and the psychomotor domain.

The cognitive domain is concerned with knowing and includes activities such as remembering and recalling knowledge, thinking, problem solving, creating etc. It is in the cognitive domain that such work in curriculum development has been done. The objectives in the cognitive domain are:

Knowledge → Comprehension → Application → Analysis → Synthesis → Evaluation

Now let us go through the objectives in cognitive domain.

**Knowledge**

Knowledge includes those behaviours and test situations which emphasise the remembering either by recognition or recall of ideas, materials or phenomena. In the classification of the knowledge objectives the arrangement is from the specific and relatively concrete types of behaviour to the more complex and abstract ones. Thus the types of information such as names, dates, events, persons, places to process, movements and phenomena and then to still more complex ideas such
as the knowledge of universals, abstractions, theories and generalisations underlying a particular area or phenomenon.

Comprehension

Comprehension includes those objectives, behaviours or responses which represent an understanding of the literal message contained in a communication. In this sense comprehension involves an understanding of the material being communicated and also making use of the material without relating it in anyway to other material.

Application

Application involves the use of abstractions in particular and concrete situations. The abstractions may be in the form of general ideas, rules of procedures or generalised method.

Analysis

Analysis is the breakdown of the material into its constituent parts and detection of the relationships of the parts and of the way they are organised.

Synthesis

Synthesis is the putting together of elements and parts so as to form a whole. This involves the process of working with pieces, parts, elements and arranging and combining them in such a way as to constitute a pattern or structure not clearly therebefore.

Evaluation

Evaluation is the making of the judgements about the value for some purpose of ideas, works, solutions, methods, materials etc.

The affective domain is concerned with ‘feeling’. The objectives in this domain describe changes in interest, attitudes, values, development of appreciations and adequate adjustment. The objectives in the affective domain are,
Receiving (appreciation)

Responding (interest)

Valuing (attitudes)

organising (Value system)

Characterization (Character formation)

Now let us see the objectives one by one:

**Receiving**

This is at the lowest point on the affective taxonomy. This category is defined as sensitivity to the existence of certain phenomena and stimuli that is, the willingness to receive or attend to them.

**Responding**

Responding refers to a behaviour which goes beyond merely attending to the phenomena; it implies active attending, doing something with or about the phenomena and not merely perceiving them.

**Valuing**

Valuing implies perceiving them as having worth and consequently revealing consistency in behaviour related to these phenomena.

**Organization**

Organization is defined as conceptualization of values and the employment of these concepts for determining the interrelationship among values.

**Characterization**

The organization of value internally consistent system is called characterization. It implies the organization of interrelationship among various values into a total philosophy of world view.
The objectives in the affective domain are Receiving (appreciation), Responding (interest), valuing (attitudes), organising (value system) and Characterization (Character formation).

The *psychomotor domain* is the domain of 'doing' the manipulation or motor skill area. Presumably it deals with areas involving varied types of muscular skill and co-ordinations such as those involved in mechanical work, physical training surgery, electrical trades etc. According to Dave the objectives in the psychomotor domain are

\[
\text{Imitation} \rightarrow \text{Manipulation} \rightarrow \text{Precision (Control)} \rightarrow \text{Co-ordination (articulation)} \rightarrow \text{Naturalisation (Habit formation)}
\]

Now we will discuss the objectives one by one.

**Imitation**

Imitation involves the ability of the learner to perform an act according to given instructions, but often lacks any sustained control. That means perform actions which are impulsive and imperfect.

**Manipulation**

Manipulation means the learner is able to perform an act according to given instructions rather than doing an observation on initiation pattern.

For example, following directions, performing actions and practising actions etc.
Precision (Control)

Precision refers to the ability of the learner to practice and to perform components of complex task. Errors are minimized with practice.

For example

Reproducing action with control, accuracy and exactness

Articulation (Co-ordination)

Articulation refers to the ability of the learner to co-ordinate a series of facts by establishing sequence and harmony.

For example: Performs with accuracy, control, speed and time.

Naturalisation

Naturalisation refers to the ability of the learner to perform automatically and spontaneously.

For example: Performance become routinised, natural and smooth.

Self Check

1) Which are the three domains of educational objectives according to Dr.B.S.Bloom?

2) The cognitive domain is concerned with _____

3) The ability of the learner to use abstractions in particular and concrete situations is the objective.

4) List out the objectives under affective domain
UNIT - III

Tools of Evaluation

A tool may be defined as an instrument or implement that facilitates the work of the hand and the eye. A tool of evaluation as used in education is a device or technique that will facilitate the process of measuring and recording the characteristics of pupils. Tools of evaluation are sophisticated techniques of appraisal, intelligently designed to measure what is required to be measured. Modern evaluation uses a variety of techniques of appraisal such as achievement, attitude, personality and character tests, rating scales, questionnaires, judgement scales of products, interviews, controlled observation techniques, sociometric technique and anecdotal records. (J.W. Wrightstone).

Now we will discuss the commonly used evaluation tools.

Tests

Test is the most popular tool used for collecting data for evaluation. Tests can be of two types.

a) Standardised tests (Psychological tests)
   eg: Personality, intelligence, attitude, aptitude etc

b) Non standardised tests (Teacher made tests)
   The most common teacher made tests can be broadly divided into three categories.

Written test

In written tests the respondent has to respond in written form. In these type of tests a question paper is provided to the respondent to respond
either in the same paper of in the answer sheet provided for the purpose of answering.

**Oral Tests**

In oral tests the examiner asks questions for which the respondent respond orally.

**Practical test**

In practical tests the examiners are required to do exercise using objects or apparatus given to them.

**Questionnaires**

A questionnaire is a useful tool of evaluation. A large amount of data on various aspects of the theme in hand can be collected and the respondent can be evaluated accordingly. The information collected with the help of a questionnaire may be used for evaluating personality traits, interests, opinions, likes and dislikes.

**Observation**

Observation is a tool by which the external behaviour of a person/persons in controlled or uncontrolled situations can be observed and recorded. Observation is an attempt to observe and appraise whatever happens. The two commonly used methods of observation are

a) the directed observation and

b) the anecdotal method

The directed observation procedure is directed towards a particular pupil or pupil group under controlled condition. The anecdotal method make use of class room situations and evaluation is done on
the basis of results obtained from observation of pupil behaviour at a time.

**Check list**

Check list is something like a two dimensional chart in which the traits measured are noted in one dimension and the names of the examinees in the other.

**Rating Seale**

Rating seale resembles checklist but when finer discrimination is required, rating scales should be used instead of checklists because check list record only the presence or absence of certain traits or characteristics and happening or not of a particular event while rating seales add how much or how well it happened. ie the degree to which a particular trait is present which can be evaluated with the help of a rating scale. Thus rating scales are improved devices in comparison to check list.

The degree of the presence of a particular trait may be rated quantitatively as always, sometimes, never and qualitatively as good, average, poor. These can also be quantified by assigning numbers from 1 to 5.

**Anecdotal records**

This device is used for recording of the specific incidents, factual description of meaningful events or behaviours of the students as observed by the teacher from time to time. Anecdotal records include both the objective description of behaviour and an interpretation of it.

**Self-Check**

1. Techniques of appraisal designed to measure what is required to be measured is called ____________

2. The degree to which a particular trait is present may be evaluated by using ____________
3. List out the commonly used evaluation tools.

UNIT - IV

Characteristics of a good Evaluation Tool

Validity, reliability, objectivity and practicability are the characteristics of a good measuring instrument.

Validity

Validity of a test refers to the test's quality to measure what it is intended to measure. In the words of Gate’s “A test is valid when it measures truly and accurately the ability or quality one wants to appraise.” Thus validity means truthfulness of the test. Validity is a specific rather than a general criterion of a good test. It is specific in the sense that a test may be highly valid for use in one situation and highly invalid for use in another manner. It may be valid for use with one group of pupils but not for use with a different group of pupils.

There are different types of validity. The important among them are

1. Face Validity
2. Content Validity
3. Factorial validity (Construct validity)
4. Predictive validity
5. Concurrent validity

Face validity means the given test appears or seems to measure what it is to measure. This validity refers to what the test seems to measure.

Content validity is considered in relation to achievement tests. An achievement test has content validity if it represents faithfully the
objectives of a given instructional sequence and reflects the emphasis accorded to these objectives as the instruction was carried out. Thus content validity is determined by the fact that it adequately covers both the content and objectives of the subject matter unit on which the test is based.

Construct validity of a test refers to the extend to which the test measures a particular characteristic of the individual. predictive validity determines the future success of the test. The predictive validity of a test is determined on the basis of an established criterion. Tests are said to have concurrent validity when they can distinguish between two or more groups of individuals whose status at the time of testing is different.

Reliability

Reliability is the consistency of a test yielding the same results in measuring whatever it does measure. According to Anastasi (1998) “The reliability of a test refers to the consistency of score obtained by the same individual on different occasions or with different sets of equivalent items.

Reliability depends upon three factors

1. The length of the test: a longer test is more reliable than a shorter one.
2. Objectivity in scoring: a test which can be objectively scored can yield more reliable results than otherwise.
3. Clarity of instructions: if the instructions are ambiguous, different pupils are likely to interpret them differently and hence different answers. Consequently the score obtained cannot be said to be reliable.
Objectivity

A test is objective when it makes for the elimination of the scorer's personal opinion, bias, or judgement. Objectivity is closely related with reliability. Objectivity can be expressed in terms of coefficient of objectivity.

Practicability

Practicability relates to the practical aspects of the test in respect of administration, scoring and economy. Practicability is the degree to which the test or other measuring instrument can be successfully employed by classroom teachers and school administrators without an unnecessary expenditure of time and energy. Practicability of a test depends upon the following factors.

1. ease of administration
2. ease of scoring
3. ease of interpretation
4. economy of cost, time and energy

Self-check

1. Validity, reliability objectively and practicability are the ________ of a good evaluation tool

2. Reliability is the __________ of a test, yielding the same result in measuring whatever it does measure.
ANSWER KEY

Unit I
1. Qualitative
2. 1) Objectives 2) Learning experiences 3) Evaluation
3. Objectives

Unit 2
1. Cognitive domain, Affective domain and Psychomotor domain
2. Knowing
3. Application
4. Perception, Impulsion, Manipulation, Control, Co-ordination, and Naturalisation.

Unit 3
1. Tools of evaluation
2. Rating scale
3. Achievement test, Questionnaire, Observation, Check list,
4. Rating scale, Anecdotal records.

Unit 4
1. Characteristics
2. Consistency
3. Validity
(Answer all questions. Each question carries one mark
For Questions 1 to 20 choose the correct answer)

1. The qualitative interpretation and value judgement about something is known as,
   a. Measurement  
   b. Evaluation  
   c. Value judgement  
   d. None of these

2. The pre-determined target around which the process of teaching and evaluation revolves are called,
   a. Learning experiences  
   b. Measurement  
   c. Objectives  
   d. Evaluation

3. An appraisal of the change that occur in the child as a result of learning experiences provided to them is,
   a. Evaluation process  
   b. Self – Appraisal  
   c. Behavioural objectives  
   d. Pupil activities

4. Select the objective which doesn’t come under cognitive domain
   a. Knowledge  
   b. Comprehension  
   c. Application  
   d. Receiving

5. The psychomotor domain is the domain of
   a. Feeling  
   b. Knowing  
   c. Doing  
   d. Organising

6. The use of abstractions in particular and concrete situations is the objective,
   a. Comprehension  
   b. Analysis  
   c. Evaluation  
   d. Application
7. The objective 'attitude' belongs to
   a. Cognitive domain  
   b. Affective domain  
   c. Psychomotor domain  
   d. None of these  

8. The intelligence test is an example for
   a. Standardised test  
   b. Non-Standardised test  
   c. Teacher made test  
   d. Practical test  

9. The most popular tool used for collecting data for evaluation is
   a. Observation  
   b. Tests  
   c. Interview  
   d. Rating scale  

10. Written test, oral test, and practical tests are the three categories of,
   a. Standardised test  
   b. Achievement test  
   c. Non-Standardised test  
   d. Name of these  

11. The tool used for recording the specific events or behaviours of the student is,
   a. Check list  
   b. Anecdotal record  
   c. Rating scale  
   d. Observation  

12. The ability of the learner to become aware of actions, objects qualities or relation through his senses are referred to as,
   a. Application  
   b. Impulsion  
   c. Perception  
   d. Co-ordination  

13. The tool which is used when a large amount of data required is,
   a. Observation  
   b. Written test  
   c. Oral test  
   d. Questionnaire  

14. The tool in which the external behaviour of a person/persons in controlled or uncontrolled situation recorded is called,
   a. Check list  
   b. Observation  
   c. Rating scale  
   d. Practical test  

15. The degree to which a particular trait is present may be evaluated by using
   a. Check list  
   b. Rating scale  
   c. Questionnaire  
   d. Achievement list
16. Validity, reliability, objectivity and practicability are the ................. of a good measuring instrument.
   a. Advantages  b. Needs  
   c. Merits  d. Characteristics  

17. Which of the following statement is not related to validity of a test.
   a. A test is valid when it measures truly and accurately.
   b. Validity of the test means truthfulness of the test.
   c. A test is valid if it measures what it is intended to measure.
   d. The validity of a test doesn’t vary with situation.

18. Which of the following is not belongs to Teacher made test
   a. Intelligence test  b. Written test 
   c. Oral test  d. Practical test  

19. The ability of the learner to put parts together to form a new whole is termed as.
   a. Comprehension  b. Application 
   c. Analysis  d. Synthesis  

20. The modern evaluation technique adopted in secondary level according to SSA method is,
   a. Continuous evaluation  b. Continuous and comprehensive evaluation  
   c. Formative evaluation  d. Summative evaluation  

Some statements are given below. If it is true tick (✓) against True and if it is False tick (✗) against False.

21. The objectives, learning experiences and evaluation in educational process are mutually inter related
    True/False  

22. Pupil activities planned with the specific purpose of producing the desired behaviour change in the pupils are called evaluation.
    True/False  

23. Tools of evaluation are techniques of appraisal designed to measure what is required to be measured
    True/False  

24. The reliability of a test is the consistency of score obtained by the same individuals on different occasions or with different sets of equivalent items.
    True/False  

25. Anecdotal records are something like a two dimentional chart.
    True/False
Appendix 11

Scoring Key

1  b
2  c
3  a
4  d
5  c
6  d
7  b
8  a
9  b
10 c
11 b
12 c
13 d
14 b
15 b
16 d
17 d
18 a
19 d
20 b
21 True
22 False
23 True
24 True
25 False
PRE-TEST AND POST-TEST SCORES OF STUDENT TEACHERS IN THE CONVENTIONAL METHOD, EXPERIMENTAL GROUP-I, EXPERIMENTAL GROUP-II AND EXPERIMENTAL GROUP-III.

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</tbody>
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