Chapter III
Tool Construction

The present study primarily focused on investing basic employability skills (BES) of secondary school children. It necessitated having good / proper tools measuring basic employability skills (BES) of secondary school children. In this present study, basic employability skills are measured on the basis of academic (Reading skill, Writing skill, Listening skill) and higher order thinking skills (Analysis, Creativity, Evaluation) and personal skills (Ethics & Values, Motivation, Entrepreneurial skills and Self confidence). The tools measuring basic employability skills (BES) have been constructed by the researcher this chapter begins with explanation of rationale of constructing the tools. As the investigator has constructed the tools, this chapter explains the nature of items of each tool. The reliability and validity of tools has also been stated in this chapter.

Employability Skills

Definition of employability skills: Abilities of employee required by employers to perform the tasks of organization and to achieve goals.

Employability skills
- Composite skills: Technical and non-technical skills
- Natures are different for different jobs
- However certain skills / personal qualities are basic and common for all types of jobs / occupation
- Examples: Communication Skills, Interpersonal Skills, Analytical Skills etc.

Basic Employability Skills (BES)

Definition: Group of some important basic or foundation skills / qualities which instilled in each individual to produce productive workforce in all profession

Advantages of Basic Employability Skills (BES)
- Enhance employability
- Occupational skills for all sectors

Employee Focus for this research (sectors)
- Since Basic Employability Skills are work readiness skills, they are very important for employee having basic education (secondary or higher secondary)
- Also Basic Employability Skills are beneficial for entry level employee from sectors like Marketing, Tourism, Agriculture and Construction
Basic Employability Skills for this Research

I) Academic Skills

1) **Listening Skills**: It enables to understand meaning of words and sentences, oral communication, to interpret spontaneous response to etc.

2) **Writing Skills**: It enables to communicate thoughts, ideas, information and messages in writing and creates documents such as letters, directions, manuals, reports, graphs and flow charts etc.

3) **Reading Skills**: It enables to locate, understand and interpret written information in prose and in documents such as manuals, graphs and schedules etc.

II) High Order Thinking Skills

1) **Analytical skills**: It is the capacity to examine carefully. It is the ability to analyses information and experiences in an objective manner to perceive the total situation with logic and reasons.

2) **Creativity Skills**: It is the potential capacity to solve problems. It enables us to explore alternatives and various consequences of our actions and non actions.

3) **Evaluation Skills**: It is the capacity to study the facts and form the opinion. It is the ability to evaluate information and take informed decision by assessing the advantages and disadvantages of different option.

III) Personal Skills / Qualities

1) **Self confidence**: It enable to believes in own self worth and maintains a positive view of self.

2) **Ethics and Values**: It enables to develop integrity and honesty. It develops trust on values. It helps to understand the impact of violating social beliefs and codes of an organization, self and others and chooses an ethical course of action. It helps to develop beliefs and values that every employee need to be a good citizen in community or in working place.

3) **Motivation**: It is the drive which enable to get things done. It enables to start the activities, direct the activities and continued so that physical or psychological needs or wants are met.

4) **Entrepreneurial Skills**

It is the ability of the individual possessing wide range of essential skills and attributes to create, cope with and enjoy change and make creative contribution in the word of work whether employment or self employment. It includes the proficiencies like creativity, self belief, energy, initiative and a disciplined and positive attitude towards work.
It starts early in the education journey of the learners and maintain over the entire education period.

<table>
<thead>
<tr>
<th>Employability Skills</th>
<th>Nature of Job / Sector Suitable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Writing Skills</td>
<td>Media (Copy writer), Translators, Banking, Journalist</td>
</tr>
<tr>
<td>2) Listening Skills</td>
<td>Interpreter, Teacher</td>
</tr>
<tr>
<td>3) Reading Skills</td>
<td>Advt. Media, TV / Radio</td>
</tr>
<tr>
<td>4) Thinking Skills</td>
<td>Research Assistant, Scientist, Advertising</td>
</tr>
<tr>
<td>5) Motivation, Self Confidence, Ethics and Values</td>
<td>All occupations / Sectors</td>
</tr>
<tr>
<td>6) Entrepreneurial Skills</td>
<td>All occupations / Sectors</td>
</tr>
</tbody>
</table>

**Research Tools**

The researcher constructed research tools with the help of his research guide and experts. The details of the research tools are given below.

**Tools for testing basic employability skills**

<table>
<thead>
<tr>
<th>Skills</th>
<th>Pattern of Questions</th>
<th>Duration for Testing</th>
<th>No. of Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Reading Skills</td>
<td>Descriptive</td>
<td>20 min.</td>
<td>2</td>
</tr>
<tr>
<td>2) Writing Skills</td>
<td>Descriptive</td>
<td>25 min.</td>
<td>2</td>
</tr>
<tr>
<td>3) Listening Skills</td>
<td>Descriptive</td>
<td>10 min.</td>
<td>2</td>
</tr>
<tr>
<td>4) High Order Thinking Skills</td>
<td>Making Preference</td>
<td>35 min.</td>
<td>20</td>
</tr>
<tr>
<td>5) Ethics and Values,</td>
<td>Making Preference</td>
<td>12 min. each</td>
<td>10 Q. each</td>
</tr>
<tr>
<td>Motivation, Self Confidence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) Entrepreneurial Skills</td>
<td>Making Preference</td>
<td>25 min.</td>
<td>37</td>
</tr>
</tbody>
</table>

**Construction of Tools (Questionnaire)**

The employability skills in the research have been identified through U.S. development of labour’s secretary’s commission on achieving necessary skills (SCANS).

For this research, the selection of exact attributes and skills was a complex and difficult task. But the SCANS 1992 report entitled “What Work Requires of Schools”, established a base for basic employability skills.

By reviewing literature, discussing with experts from education and management field, the investigator decided to focus on following skills as basic employability skills for his research.
1) Academic and Higher Order Thinking Skills  
   (Reading / Writing / Listening)

2) Personal Skills and Qualities  
   (Ethics and Values, Motivation, Entrepreneurial Skills, Self confidence)

For each of skill i.e. Reading, Writing and Listening, investigator has constructed own tools. The investigator wanted to have precise tool for measurement which would not be too lengthy but appropriately measure Reading, Writing and Listening skills. Taking into account the purpose of the study nature of sample and student’s time no standardized tool was available. Hence the investigator decided to construct tools measuring Reading, Writing and Listening skills.

In this study, personal qualities namely Ethics and Values, Motivation, Entrepreneurial Skills and Self confidence have been explored among secondary school students. Standardized tools measuring Ethic and Values, Motivation, Entrepreneurial skills and Self confidence were available.

However, there were too lengthy and some of items were not applicable to school children. So, it necessitated for the investigator to construct tools appropriate for the sample.

**Questionnaire for Survey**

A) To measure Academic Skills : For framing questionnaire, the teachers manual for English subject (Marathi Medium Std. X) published by State Board of Maharashtra was considered as valid and reliable source.

B) To measure Higher Thinking Skills (HOTS) : To assess the analytical ability, evaluation capacity and creativity, a questionnaire was formed and conducted. It was based on Std. IX and X Science, Algebra and Geometry Syllabus of State Board of Maharashtra. It was also a valid and reliable source.

C) To measure Personal Skills and Qualities : The standardized tests on Motivation (Mukherjee, 2000) and on Self Confidence (Basavanna, 1975) were adopted. The researcher reviewed the existing literature on Ethics and Values as well as on Entrepreneurial Skills. The items were constricted in simple English and translated to Marathi. Items were given for content validation to the experts and basic quantitative analysis (such as reliability, mean, variability etc.) on pilot sample gave favourable results regarding the usage of tools.
Rational of the Tool

By reviewing the literature, considering the SCANS report, discussing with experts from education and management field and guide, the researcher had decided to focus on basic employability skills for his research

For academic and thinking skills

- Due to non availability of standardized tools researcher had prepared his own research tools with the help of experts.
- It was based on curriculum of Std. IX and X std of SSC board of Maharashtra (English, Geometry, Algebra, Science subjects)

For personal skills and qualities.

For ethics and values, motivation, Entrepreneurial skills and self confidence, Standardized tools were used.

Detailed Analysis (Question wise)

I) Academic Skills

The following assessment functions for Reading, Writing and Listening skills were framed and applied.

a) For reading skills

Two descriptive questions were framed. The power of skimming, scanning and understanding the concept and grammar, comprehension ability etc. were tested.

b) For writing skills

Two descriptive questions were framed. The power of expression, how to extract information and present in a diagrammatic form, understanding of content etc. were tested.

c) For listening skills

The power of understanding of words, sentences and phrases and to write them correctly etc.

Illustration (For reading skills)

The measured value of mean for reading skills was 5.9370 which were lying between 5 – 7, hence the attainment level of reading skill was moderate.

II) High order thinking skills (HOT skills)

To assess the analytical ability, evaluation capacity and creativity, a questionnaire was framed and applied.

For Higher Order Thinking Skills

\[
\begin{align*}
\text{Total Questions were asked} &= 20 \text{ Questions} \\
\text{Total Marks} &= 20 \text{ marks (20 Q x 1)}
\end{align*}
\]
Level of Attainment (Score)

<table>
<thead>
<tr>
<th>Low Level</th>
<th>Moderate Level</th>
<th>High Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 6</td>
<td>7 – 13</td>
<td>14 – 20</td>
</tr>
</tbody>
</table>

Since the mean values of HOT Skills was 8.544 which was lying between 7 – 13. The result was moderate level.

III) Entrepreneurial skills

The concept of entrepreneurial skills includes proficiencies live creativity, planning, decision making, leadership, negotiation skills, imitativeness, team work, confidence, marketing, social attitude etc.

By framing 37 questions, researcher tried to assess most of the proficiencies of entrepreneurial skills present in secondary students.

Some examples

**Questionnaire for Entrepreneurial skills**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Q. No.</th>
<th>To Test Proficiency for Entrepreneurial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Q. 4</td>
<td>Confidence</td>
</tr>
<tr>
<td>2</td>
<td>Q. 6</td>
<td>Initiatives</td>
</tr>
<tr>
<td>3</td>
<td>Q. 19</td>
<td>Social Attitude</td>
</tr>
<tr>
<td>4</td>
<td>Q. 36</td>
<td>Negotiation Skills</td>
</tr>
</tbody>
</table>

For Entrepreneurial Skills

- Total Questions = 37 Questions
- Total Marks = 148 marks (37 Q x 4)
- a) Minimum Score = 37
- Maximum Score = 148
- b) Lower Level of Attainment
  
  For 100 $\rightarrow$ 35 $\therefore \frac{100}{148} = \frac{35}{x} \therefore x = 51.80$
  
  148 $\rightarrow$ x $\therefore x = 52$
  
  $\therefore$ **Lower Level is 37 – 52**

- c) Higher Level of Attainment
  
  For 100 $\rightarrow$ 75 $\therefore \frac{100}{148} = \frac{75}{y} \therefore y = 111.00$
  
  148 $\rightarrow$ y $\therefore y = 111$
  
  $\therefore$ **Higher Level is 111 – 148**
d) **Moderate Level of attainment 53 - 110**

Since the mean values of entrepreneurial skills was 106.4233 which was lying between 53 – 110, the level of attainment for entrepreneurial skills was moderate. Similarly for all other remaining skills, the result was moderate level.

IV) For other skills

To assess the level of attainment of Ethics and Values, Self motivation and Self confidence, similar procedure was adopted. The results was moderate level of attainment.
Sample Items of Questionnaire

A – Reading Skills

Sample Question (A passage)

Two unseen extracts or paragraphs (5 marks each - total 10 marks) were selected from comprehension exercise book based on curriculum of Std. IX and X Std. of SSC Board of Maharashtra. In each passage, out of three, two factual question (3 marks) were asked for which answers could be easily found or located from text. One word, one phrase answers were admissible. Third question was based on personal response for which answers would be related to student's own ideas and interests in relation to the topic or to the authors point of view. The assessment functions were testing of skimming and scanning, understanding the grammar, concept etc.

Sample Question (A passage)

The following is the passage selected for the purpose of survey.

Read the passage & answer the questions given below : Total Marks 5

Sinhagad, formerly known as Kondana, was one of the most impregnable forts in western India. The fort changed hands many times; from Mohammed Tughlak in 1340 A.D. to the British in 1918 A.D. Shivaji conquered the fort in 1670 but lost his ablest commander, Tanaji Malusare. When Shivaji learnt the sad news of Tanaji's death after a gallant fight in the battle for the fort, he exclaimed, "I won the fort but lost the lion."

Thence the name of the fort was changed to Sinhagad, meaning lion- fort, in memory of Tanaji Malusare.

How to go:

Air : The nearest airport is Pune-24 km.

Rail : The nearest railhead is Pune - 24 km on Central Railway;

Mumbai-Pune : 192 km.

Road : Mumbai-Sinhagad : 194 km.

Pune-Sinhagad : 24 km

S.T. buses ply from Pune, Mumbai to Sinhagad.

a) What was Sinhagad formerly known as ?  

______________________________________________________________

______________________________________________________________

1
b) How did Sinhagad get its name?  

______________________________________________________________________________

______________________________________________________________________________

c) Write the names of any four places in Maharashtra you have visited or would like to visit.  

______________________________________________________________________________

______________________________________________________________________________
B – Writing Skills

Sample Question (A report)

(Two sub questions, A report writing and a information transfer skills carrying 5 marks each total 10 marks) were taken from writing skills exercise book based on IX and X std. syllabus.

In a report writing skill question, students were asked to prepare a report based on the events with help of given points: In a information transfer question (from Non-verbal to verbal) the students were asked to write a paragraph on information presented in simple diagram. The assessment factors were : to test power of expression, how to extract information and present in a diagrammatic form, how to describe people, events, places, interpretation skills, understanding of content, vocabulary range, background knowledge etc.

The following is the report writing selected for purpose of survey.

Write a report on how your school celebrated Environment Day : Total Marks 5

Make use of the following questions.

1) When did you celebrate environment day ?

2) What were the arrangements made ?

3) Who were present on the occasion ?

4) How did you celebrate it ?

5) Why did you decide to celebrate it ?

6) Where were all the arrangements made ?

7) What is the importance of the day ?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
C – Listening Skills

Sample Question (Words / Sentences)

Two types of tasks: Listening and writing words and sentences, were conducted which were carrying 3 marks each. In this tasks the researcher was reading five words and five sentences twice loudly and the students were asked to write any three words and sentences from it on answer sheet in 10 minutes.

In this test, the ability to listen with understanding of words, phrases, short sentences and to write it correctly were tested.

The following list of words and sentences is selected for purpose of survey.

1) The words and sentences for the oral test for listening skill

The teacher will read out (only 3 words and only 3 sentences) and each word and sentence will be read twice. Students have to listen the words and sentences carefully and write them.

Words (any three)

1) listen 2) escape 3) fibres 4) brook
5) altitude 6) uproot 7) shelter 8) praise
9) creative 10) prevent 11) country 12) recover

2) Sentences (any three)

1) Take this medicine twice a day.
2) What a wonderful day it is!
3) Can you help me now?
4) Give me a glass water.
5) How many colours are there in a rainbow?
6) Don’t make noise here.
7) What a beautiful scene it is!
8) May I come in sir?
9) Do you like playing cricket?
10) How many members are there in your family?
Listening Skill
(Answer Paper)

Total marks : 6

Three Words:
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

Three Sentences:
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
D – High order Thinking Skills

To assess the analytical ability, evaluation capacity and creativity, a questionnaire/test consisting 20 multiple choice questions for 20 marks was framed and conducted. It was based on IX and X Std. Science, Algebra and Geometry Syllabus of Secondary School Board of Maharashtra. The main criteria for assessing were to test the ability of synthesis, generalization, explanation, interpretation, manipulation and understanding the concepts etc.

Sample Questions

Q.1 – In polluted cities, it may harmful to get wet in first shower, during monsoon because first shower ……
   a) may develop cold in body        b) may develop fever
   c) may consist acid rain           d) none of these

Q.2 – Amar is travelling by his car with uniform velocity in the same direction. What will be the acceleration of his car.
   a) positive                     b) negative
   c) zero                         d) none of these
# Personal Qualities and Skills

## Table III (a)

Table showing sample item, response pattern and scoring of the tools

<table>
<thead>
<tr>
<th>Tool</th>
<th>Sample Item</th>
<th>Options</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethics and Values</td>
<td>Do you believe that discrimination in any form is wrong</td>
<td>True</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>False</td>
<td>2</td>
</tr>
<tr>
<td>Motivation</td>
<td>I am always careful</td>
<td>a) To please others with my manners</td>
<td>a) -1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) To do my best in whatever I undertake</td>
<td>b) -3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) To perform activities in my own way</td>
<td>c) -2</td>
</tr>
<tr>
<td>Entrepreneurial Skills</td>
<td>Does it often take you a long time to get started on something</td>
<td>a) Always</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Often</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) Sometimes</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d) Never</td>
<td>4</td>
</tr>
<tr>
<td>Self confidence</td>
<td>I am hesitant about taking decisions on my own</td>
<td>True</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>False</td>
<td>2</td>
</tr>
</tbody>
</table>
Reliability and Validity

The field of education is in a state of flux and educational testing reflects it, both in the US and around the world (Anastasi and Vrbina, 2008). Many observers agree that there is a need to integrate assessment and instruction in such a way that these aspects of the educational enterprise of the learner. In the present research, the researcher has constructed tools to assess basic employability skills of the learner. (i.e. reading, writing and listening skills) Even higher order skills i.e. (analytical, synthesis and evaluate aspects) have been assessed. Along with cognitive aspects the present research has also included aspects related to personal skills. Assessment of personal skills and qualities includes ethics and values, motivation, entrepreneurship skills and self confidence.

Thus, the research examines cognitive aspects as well as behavioral aspects of the learner. The researcher constructed tests to measure each of the skills included in the study. The tests constructed are objective measures of the skills examined in the study. In the earlier section of the chapter the description of the tests has been given. For any test to be put to use, its reliability and validity are essential factors.

Reliability

Reliability refers to the consistency of scores obtained by the same persons when they are reexamined with same sets on different occasions or with different sets of equivalent items or under other variable examining conditions. The concept of reliability underlies statistical computations by which we can predict the range of fluctuation likely to occur in a single individual’s score as a result of irrelevant or unknown chance factors. The concept of reliability has been used to cover several aspects of score consistency. Thus, the test reliability indicates the extent to which individual differences in test scores are attributable to “true” differences in the characteristics under consideration and the extent to which they are attributable to chance errors. Higher the reliability coefficient more the likelihood of true differences. There are different ways by which reliability of a test can be computed. The type of reliability of a test can be computed. The type of reliability measure depends on the nature of the test.

In the present study, items for reading, writing, listening and higher order skills have been adapted from the “The Teacher Manual for English subject (Marathi Medium Std. IX and X) published by the State Board of Maharashtra and the Std. IX and X textbooks of science and mathematics of SSC Board of Maharashtra. Separate reliability and validity for the tests assessing reading, writing, Listening and HOT Skills has not been statistically computed.
Extent of tests was however shown to several academicians. Approval of the items was sought by the experts and on their confirmation the tests items were finalized. The content validity was reported to be satisfactory. For the tests constructed assessing personal qualities it was felt necessary to compute reliability indices. The tests on ethics and values, motivation, entrepreneurship skills and self confidence were administered to pilot sample of 97 Marathi Medium studying in Std. IX and Std. X from different schools. The data was scored. Score of each respondent on each item of the respective test was entered in SPSS (17th version) Cronbach Alpha reliability coefficient was computed for ethics and values test, motivation tests and entrepreneurship skills tests. Kuder-Richardson reliability coefficient was computed for test of self confidence.

Kuder-Richardson and Cronbach Alpha are methods for finding reliability based on the consistency of responses to all items in the test. For such type of reliability the tests needs to have homogenous items. Since each of test measured a single aspect inter item consistency proved to be the best method for finding reliability.

Table III (b)

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of Statements / Questions</th>
<th>Range of Scores</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethics and Values</td>
<td>10</td>
<td>10 – 20</td>
<td>0.82</td>
</tr>
<tr>
<td>Motivation</td>
<td>10</td>
<td>10 – 30</td>
<td>0.84</td>
</tr>
<tr>
<td>Entrepreneurial Skills</td>
<td>37</td>
<td>37 – 148</td>
<td>0.88</td>
</tr>
<tr>
<td>Self confidence</td>
<td>10</td>
<td>10 – 20</td>
<td>0.79</td>
</tr>
</tbody>
</table>

The Cronbach’s Alpha value for overall scale is 0.82, 0.84, 0.88 and 0.79 resp. The Cronbach’s Alpha value based on standardized items is 0.70. [Pedhazur and Schmelkin (1991)] Hence reliability of tools was established.
### Tools constructed and used for Teachers Survey

The multiple type questionnaire contains 10 questions pertaining to the various aspects of overall development of students.

The first section consisted questions related to relation between student and teacher, personality development subject, higher order thinking skills, career orientated, knowledge about management science. The second section of questionnaire was dealing with personal views of teachers regarding overall development of student.
Reference