CHAPTER – III

DEVELOPMENT OF PEDAGOGICAL CONTENT
KNOWLEDGE PACKAGE

Packages are developed aiming to achieve specific educational objectives with least time and resources. They have to assure the quality, practicability, effectiveness regarding their objectives. Enrichment of package with these attributes is possible through systematic development of package.

The process of development of package has many dimensions, approaches and phases. Especially, Educational or Non-technical package development is complex process because, it involves the human elements at every stage. But, packages have good results. The V and VI volume of Survey of Educational Research (NCERT, New Delhi) shows various studies related to instructional packages, multimedia packages. Self instructional packages etc. having significant impact on attitude, skills, scholastic achievements etc.

3.1 Selection of Model for Package Development

There are various popular models for package development like three phase model for instructional package (Wittch, W. A. & Schuller C. F.), Gaya, T. K. (1988) proposed Basic Instructional System Design Model.

Vanaja, M. and Rajshekhar, S. mentioned types of model in their book namely 'Educational Technology and Computer Education'. They are as follows:

1. Objective based
2. Skill based
3. Competency based
4. Model based
5. Learner-Style based
6. Value based

In present study researcher adopt mixed strategy (objective based + skill based + model based) while selecting model for package development.

Among these models Gaya's model is selected for this package development. Because –

1. It have great relevance with objectives of present study.
2. It have evaluation mechanism.
3. It have cyclic system which is useful for quality improvement of package.
It means compare to other model it has good mechanism of improvement through development-evaluation-revise process. The General Structure of model is shown here.

**Fig. No. 3.1 Instructional System Design Model, Gaya T. K. (1988)**

This model emphasises on the defining and revisement of package.

'Define' phase is abstract and is more intellectual activity that brings essential clarity required for further steps. It defines the need based objectives, expected attributes, components, parts sequences etc.

The phase of 'Develop' belongs to processing and organization of content and components in well defined frame of objectives and attributes. It is the central phase connecting to all other phases.

'Evaluate' phase of establishing the standards of package, it is the judgement of degree of validity, relevance of package with the objectives, adequacy, accuracy, practicability etc. This phase provides feedback for revise.

'Revise' is phase of assimilation of feedback emerged by 'Evaluate' phase. It produces the way to strengthen package. The standards of package like validity, relevance, adequacy etc. are strengthened by editing the content, components, their sequences and organization.

**3.2 Use of Gaya's Model for Present Study**

The stage of development arises repeatedly as per the necessity of degree of accuracy. This package is purposed to develop pedagogical content knowledge package for enhancement of social intelligence among IXth standard pupils with following objectives.

- To provide adequate knowledge and skills to teacher trainees for the enhancement of social intelligence among IXth standard pupils.
• To enable teacher trainees to construct pedagogical content knowledge blended with social intelligence for teaching of their own school subject.

• To enable teacher trainees for practising social intelligence based classroom practises.

These objectives may be achieved successfully by developing the package in a systematic way.

Researcher has framed this model by applying basic phases of Gaya Model (1988), but due to two time repetition of Develop, Evaluate, Revise it has became six phases process. Restructured Model is as follows:

Fig. 3.2 : Restructured Model for Present Study

The flow of task, activities and phases based on Gaya’s Model (1988) are moulded shown in Fig. No. 3.3
Development of pedagogical content knowledge package for teacher trainees to enhance social intelligence among 9th standard pupils

Phase – I
Define

- Define the nature of Package
- Define the component of Package
- Define the parts of Package

Phase – II
Develop

- Searching Periodicals books & Websites
- Collecting from Periodicals, books & Website
- Editing
- Organizing

- Searching Periodicals books & Websites
- Collecting from Periodicals, books & Website
- Editing
- Organizing

- Searching Periodicals books & Websites
- Collecting from Periodicals, books & Website
- Editing
- Organizing

Expert I
Expert II
Expert III
Expert I
Expert II
Expert III
Expert I
Expert II
Expert III

Phase – III
Evaluate

- Discussion with Guide about the opinion & suggestion of Expert, on the basis of that opinion & suggestion and Reconstruction of Package

Phase – IV
Revise & Develop

Phase – V
Evaluate

Phase – VI Revise & Develop

Discussion with Guide

Final form of Package

Fig. No. 3.3 : The Flow of Task of Restructured Model of Present Study
The phase – I defines the nature, components and parts of package in regardance of objectives. For present package, the nature, components and parts of package emerged from social intelligence, pedagogical content knowledge for secondary school pupils.

The phase of development (Phase – II) involved preparation of first draft of package. The draft is constituted with three parts. First part belongs to understanding of social intelligence, its meaning, nature and strategies enhancement. Part – II has components related to pedagogical content knowledge and Part – III is based on lesson planning for social intelligence.

The suggestions, recommendations by the experts were assimilated and package was recomposed, reorganized in the phase of 'Revise. This revised draft of package was evaluated in next phase of 'Evaluate' (Pilot Study).

The pilot study evolved empirical outcomes dealing with simulated situations, keeping the view to lead the package in practical situations, the outcomes are discussed with guide and final package was formed. The practical implementation of package was planned.

3.3 Development of Package

Researcher has framed model by applying basic phases of Gaya. Due to three times repetition of develop – evaluate – develop - revise cycle, it has become six phases process. The phases in details are discussed below.

3.3.1 Phase – I : DEFINE

This phase belongs to –

i) to define nature of package

ii) to define components of package

iii) to define parts of package.

As per mentioned above initial and vital task is to define the nature of package, focused to describe the general features in regarding to medium components, presentations etc.

3.3.1.1 Defining Nature of Package

This is the first phase of package development. While defining the nature of package there are two issues – what should be the content of package and another how it should be presented. These issues also represents the problems of quality and practicability, internal nature and external nature.

This package targets secondary school pupils through medium of teacher trainees. Therefore, package is written in the medium of Marathi language due to context of package is related to persons working in Marathi medium B. Ed. Course.
The discussion of related issues is extended with following points –

• Simple and Systematic
• Manipulability
• Interactivity
• Liveliness
• Evaluative and Effective
• Adequacy
• Relevance and Rationality
• Time Bound

**Simple and Systematic**

Package is presented by using terminology that has been popular among the people of Education. The explanation with view point of theoretical psychology or epistemology is avoided with tossing its essence in regardance of social intelligence and pedagogical content knowledge.

The components of training are connected with appropriate training activities. There is harmony between theoretical aspects and practical aspects. It has lead the package to systematicness.

The concepts involved in the package are explained in common language with suitable examples, diagrams and tables. Therefore, it is simple to comprehend.

**Manipulability**

Training and teaching practices used in package doesn't require any special kind of training to teacher educator or student teachers. Their effective application for social intelligence is expected from them. The resources for content enrichment or classroom teaching are not much costly. Newspapers, transparencies, posters etc. can be available easily. This package requires very few supportive resources and activities involved in package are simple, easy having expected effectiveness. Therefore, the package is manipulable with very few efforts.

**Interactivity**

The activities involved in the package are interactive, they create a healthy environment to enhance social intelligence without tossing scholastic approach.

The package prefer to participate the trainees through group discussion, individual activity, simulation, group work etc. It keeps them active with interactive lectures and presentations. This interactivity is helpful to set their attitude, interest and joy of training.
Liveliness

The use of package for training should not be mechanical for acquisition of knowledge and skills, it is vital reconstruction of attitude and behaviour in regardance of social intelligence.

The training provide opportunities to participate, express own opinions, making inquiry and initiating dialogue on various issues related to individual as well as society with educational approach.

Evaluative and Effective

The mechanism to guide the degree of success package is part and parcel of this package. The effectiveness of package can be evaluated by standard tests considering similar components of social intelligence or by qualitative techniques like observation, questionnaire etc.

The package has provided a series of tests for teacher trainees to evaluate their components wise progress. The effects of package is evaluated on the level of students. Because, they are the product of effective teacher and they are the targeted through the medium teacher trainees. By considering the seen and unseen variables affecting the process, the package is found effective under circumstances of this study.

Adequacy

The package is adequate to components of social intelligence, pedagogical content knowledge and practice teaching. The theoretical aspects covered are sufficient to practise at secondary level school teaching.

Relevance and Rationality

The training package has kept relevance of social intelligence with secondary school curriculum. Its content is based on theories of Psychology and Education. It is developed in systematic way by rational understanding of researches in the field of Educational Package development.

Time Bound

Development of social intelligence, pedagogical content knowledge and mastery over teaching takes a long period to come at a standard. This package doesn't claim to develop social intelligence to mastery but it plays significant role to bring observable measures progression is adequacy.

3.3.1.2 Defining Components of Package

The general objectives of the package have been emerged from three major areas, studies in the social intelligence, pedagogical content knowledge and classroom practices. The discussion with experts and teachers have directed in defining the components of package sourced from major areas.
The terms 'social intelligence, pedagogical content knowledge, classroom practices are complex, multifaceted phenomenon. One has to limit the dimensions according to context and competencies to manipulate them. Here, the package is focused towards the enhancement of social intelligence through classroom teaching of school subjects at secondary level.

The major issue in defining the components is relevance of the components to pedagogy of particular school subject and its measurability. Unless, the measurement the applicability of package, degree of success toward objectives will be unclear.

While development process of the package researcher has worked by tetra fold approach as following –

**Fig No. 3.5 : Working Nature of Defining Components and Parts of Pedagogical Content Knowledge Package**
Researcher's Observations

Researcher is working in the field of Education and working with social intelligence. The insights observations and critical thinking has been playing key role in the development of package.

Researches and Related Literature

The studies related to social intelligence, pedagogical content knowledge and training methods are used to take decisions for selection of components and organization of parts of package.

The related literature available in both electronic and printed form. The information accessed through these sources deals with i) theoretical aspects of social intelligence, pedagogical knowledge etc. ii) Training methodologies – activities.

Guide and Experts Judgements

Judgements of guide and experts from the field of Education, Philosophy and Sociology, Educational Psychology and Educational Technology have been taken informally as well as formally. Questionnaire, scales are used to gain guidelines from having vital role in maintaining the content and construct validity of package.

Experiences from the Field

School teachers, teacher educators and student-teachers have assisted for package development by contributing their experiences of field. They were involved in the pilot study and evaluation of tools prepared data collection.

Package have three main parts and discussion of defining components is given here partwise In first part the components included in social intelligence scale (SIS) by Chaddha, N. K. and Ganeshan, Usha (1986) are taken into consideration for preparing package. They are as – i) Patience, ii) cooperativeness, iii) confidence level, iv) sensitivity, v) recognition of social environment, vi) tactfulness, vii) sense of humour, viii) memory.

These components are discussed in detail in previous chapter-I as well as script of package.

The issues related to select components of pedagogical content knowledge and classroom practices are also important. Pedagogical content knowledge was proposed by Lee Shulman (1987) and many of studies have been carried in this area. Studies of Joshi, Anant and Salunkhe Kavita (2006), Robert, Bulek (2006), Byongs, Eumk and Newman, Landerman (2006) are used to select the components.

Shulman, Bennet and Carre (1993) emphasised that thinking about four kinds of knowledge are necessary for teachers – i) content knowledge, ii) general pedagogical knowledge, iii) pedagogical content knowledge, iv) curricular knowledge. These kinds of knowledge changes from subject to subject. Therefore, the experts have
suggested to prefer the subjects, each one from science, languages and social sciences.

Following subjects have been selected from various subjects at IXth standard representing language, science and social science in Maharashtra the syllabi of which is as per the Maharashtra State Board of Secondary and Higher Secondary Education.

**Table No. 3.1**

Selection of Various Subjects for the Study

<table>
<thead>
<tr>
<th>Group of Subject</th>
<th>Subject</th>
<th>Subjects selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Languages</td>
<td>Marathi, Hindi, English</td>
<td>Marathi</td>
</tr>
<tr>
<td>Science &amp; Mathematics</td>
<td>Physics, Chemistry, Biology,</td>
<td>Science-II (Biology + Chemistry)</td>
</tr>
<tr>
<td></td>
<td>Algebra, Geometry</td>
<td></td>
</tr>
<tr>
<td>Social Sciences</td>
<td>History, Civics, Geography,</td>
<td>History</td>
</tr>
<tr>
<td></td>
<td>Economics</td>
<td></td>
</tr>
</tbody>
</table>

**Selection of Content**

For the development of PCKP first task of researcher was to select appropriate content from IXth standard textbooks of Marathi, Science and History. For which the researcher has analysed these three books completely for identifying and finalizing content of these textbooks with reference to components of social intelligence. The subjectwise descriptive analysis is given in the appendices No. 6.1 of PCKP.

The subjectwise quantitative analysis of the textbook is presented as follows:

Analysis of Marathi textbook of IXth standard is given here.

**Table No. 3.2**

Number of Lessons (Prose & Poetry) in IXth Standard Textbook of Marathi subject related to components of Social Intelligence

<table>
<thead>
<tr>
<th>Components of Social Intelligence</th>
<th>No. of Prose</th>
<th>Percentage of Prose</th>
<th>No. of Poetry</th>
<th>Percentage of Poetry</th>
<th>No. of Lessons (Prose &amp; Poetry)</th>
<th>Percentage of Lessons (Prose &amp; Poetry)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patience</td>
<td>07</td>
<td>46.67</td>
<td>09</td>
<td>81.82</td>
<td>16</td>
<td>61.53</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>11</td>
<td>73.33</td>
<td>10</td>
<td>90.91</td>
<td>21</td>
<td>80.77</td>
</tr>
<tr>
<td>Cooperation</td>
<td>07</td>
<td>46.67</td>
<td>08</td>
<td>72.73</td>
<td>15</td>
<td>57.70</td>
</tr>
<tr>
<td>Confidence</td>
<td>11</td>
<td>73.33</td>
<td>09</td>
<td>81.82</td>
<td>20</td>
<td>76.92</td>
</tr>
<tr>
<td>Tactfulness</td>
<td>05</td>
<td>33.33</td>
<td>05</td>
<td>45.45</td>
<td>10</td>
<td>38.46</td>
</tr>
<tr>
<td>Recognition of Social Environment</td>
<td>13</td>
<td>86.67</td>
<td>10</td>
<td>90.91</td>
<td>23</td>
<td>48.46</td>
</tr>
<tr>
<td>Memory</td>
<td>07</td>
<td>46.67</td>
<td>02</td>
<td>18.18</td>
<td>09</td>
<td>34.62</td>
</tr>
<tr>
<td>Sense of Humour</td>
<td>03</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td>03</td>
<td>11.53</td>
</tr>
</tbody>
</table>
1. Out of 15 prose and 11 poetry in IXth standard textbook of Marathi subject 7 prose and 9 poetry are related to patience component of social intelligence and total weightage given to this component is 61.53%.

2. Out of 15 prose and 11 poetry in IXth standard textbook of Marathi subject 11 prose and 10 poetry are related to sensitivity component of social intelligence and total weightage given to this component is 80.77%.

3. Out of 15 prose and 11 poetry in IXth standard textbook of Marathi subject 7 prose and 8 poetry are related to cooperation component of social intelligence and total weightage given to this component is 57.70%.

4. Out of 15 prose and 11 poetry in IXth standard textbook of Marathi subject 11 prose and 9 poetry are related to confidence component of social intelligence and total weightage given to this component is 76.92%.

5. Out of 15 prose and 11 poetry in IXth standard textbook of Marathi subject 5 prose and 5 poetry are related to tactfulness component of social intelligence and total weightage given to this component is 38.46%.

6. Out of 15 prose and 11 poetry in IXth standard textbook of Marathi subject 13 prose and 10 poetry are related to recognition of social environment component of social intelligence and total weightage given to this component is 88.46%.

7. Out of 15 prose and 11 poetry in IXth standard textbook of Marathi subject 7 prose and 9 poetry are related to memory component of social intelligence and total weightage given to this component is 34.62%.

8. Out of 15 prose and 11 poetry in IXth standard textbook of Marathi subject 3 prose and 00 poetry are related to sense of humour component of social intelligence and total weightage given to this component is 11.53%.

Analysis of Science textbook of IXth standard is given here.
### Table No. 3.3

Number of Lessons in IXth standard Textbook of Science subject related to Components of Social Intelligence

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Components of Social Intelligence</th>
<th>No. of Lessons</th>
<th>Percentage of Lessons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Patience</td>
<td>10</td>
<td>85</td>
</tr>
<tr>
<td>2</td>
<td>Cooperation</td>
<td>12</td>
<td>92</td>
</tr>
<tr>
<td>3</td>
<td>Confidence</td>
<td>11</td>
<td>85</td>
</tr>
<tr>
<td>4</td>
<td>Sensitivity</td>
<td>08</td>
<td>62</td>
</tr>
<tr>
<td>5</td>
<td>Recognition of Social Environment</td>
<td>11</td>
<td>85</td>
</tr>
<tr>
<td>6</td>
<td>Tactfulness</td>
<td>08</td>
<td>62</td>
</tr>
<tr>
<td>7</td>
<td>Sense of Humour</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Memory</td>
<td>05</td>
<td>38</td>
</tr>
</tbody>
</table>

1. Out of 13 lessons in IXth standard textbook of Science subject 10 lessons are related to patience components of social intelligence and total weightage given to this component is 85%.

2. Out of 13 lessons in IXth standard textbook of Science subject 12 lessons are related to cooperation components of social intelligence and total weightage given to this component is 92%.

3. Out of 13 lessons in IXth standard textbook of Science subject 11 lessons are related to confidence components of social intelligence and total weightage given to this component is 85%.

4. Out of 13 lessons in IXth standard textbook of Science subject 8 lessons are related to sensitivity components of social intelligence and total weightage given to this component is 62%.

5. Out of 13 lessons in IXth standard textbook of Science subject 10 lessons are related to recognition of social environment components of social intelligence and total weightage given to this component is 85%.

6. Out of 13 lessons in IXth standard textbook of Science subject 8 lessons are related to tactfulness components of social intelligence and total weightage given to this component is 62%.

7. Out of 13 lessons in IXth standard textbook of Science subject none of lesson is related to sense of humour components of social intelligence and total weightage given to this component is zero.
8. Out of 13 lessons in IXth standard textbook of Science subject 5 lessons are related to memory components of social intelligence and total weightage given to this component is 38%.

Analysis of History textbook of IXth standard is given here.

Table No. 3.4

Number of Lessons in IXth standard textbook of History subject related to components of Social Intelligence

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Components of Social Intelligence</th>
<th>No. of Lessons</th>
<th>Percentage of Lessons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Patience</td>
<td>06</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>Cooperation</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Confidence</td>
<td>05</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>Sensitivity</td>
<td>08</td>
<td>80</td>
</tr>
<tr>
<td>5</td>
<td>Recognition of Social Environment</td>
<td>08</td>
<td>80</td>
</tr>
<tr>
<td>6</td>
<td>Tactfulness</td>
<td>06</td>
<td>60</td>
</tr>
<tr>
<td>7</td>
<td>Sense of Humour</td>
<td>01</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>Memory</td>
<td>02</td>
<td>20</td>
</tr>
</tbody>
</table>

1. Out of 10 lessons in IXth standard textbook of History subject 6 lessons are related to patience components of social intelligence and total weightage given to this component is 60%.

2. Out of 10 lessons in IXth standard textbook of History subject all lessons (10) are related to patience components of social intelligence and total weightage given to this component is 100%.

3. Out of 10 lessons in IXth standard textbook of History subject 5 lessons are related to confidence components of social intelligence and total weightage given to this component is 50%.

4. Out of 10 lessons in IXth standard textbook of History subject 8 lessons are related to sensitivity components of social intelligence and total weightage given to this component is 80%.

5. Out of 10 lessons in IXth standard textbook of History subject 8 lessons are related to recognition of social environment components of social intelligence and total weightage given to this component is 80%.
6. Out of 10 lessons in IXth standard textbook of History subject 6 lessons are related to tactfulness components of social intelligence and total weightage given to this component is 60%.

7. Out of 10 lessons in IXth standard textbook of History subject only one lesson is related to sense of humour components of social intelligence and total weightage given to this component is 10%.

8. Out of 10 lessons in IXth standard textbook of History subject 2 lessons are related to memory components of social intelligence and total weightage given to this component is 20%.

The selected lists of the content used in PCK from Marathi, Science and History is attached in Appendix – 4.5.

The components selected are merged with each other to form a single entity of package. The integrated nature of component can be shown as –

![Diagram of Components of Pedagogical Content Knowledge Package]

**Fig. No. 3.6 : Components of Pedagogical Content Knowledge Package**

### 3.3.1.3 Defining Parts of the Package

The component and content selected is organized in three parts of package. Experts have suggested to divide the package for through understanding of each component.
i) Preliminary Part


iii) Part – II : Pedagogical Content Knowledge

iv) Part – III : Integrated Lesson Planning based on Pedagogical Content Knowledge with reference to Social Intelligence

v) Appendices.

**Part – I : Social Intelligences : Meaning, Nature and Types**

This part covers the theoretical compression of social intelligences. The emphasis is on understanding distinctive nature of social intelligence, its facts and behavioural indicators regarding each component.

The components in this part are arranged in a sequence as 'Meaning and Nature of Intelligence', 'Multiple Intelligence', Emotional Intelligence, Social Intelligence and eight facets of social intelligence. The theoretical information is connected with implementation strategy for each component and time budget required for training.

**Part – II : Pedagogical Content Knowledge**

This part is aimed to understand pedagogical content knowledge theory as an agent of social intelligence. It puts the knowledge categories proposed by Shulman, Lee (1993) at knowledge requirements for teachers.

The information and training activities dealing with the Shulman’s teacher’s knowledge categories is given in the sequence as–

i) Lee Shulman's categorization of teacher's knowledge

ii) Subject Knowledge

iii) General Pedagogical Knowledge

iv) Pedagogical Content Knowledge

v) Curricular Knowledge

**Part – III : Integrated Lesson Planning based on Pedagogical Content Knowledge with reference to Social Intelligence**

This part is proposed for training of integration of Part – I and Part – II.

It consists

i) Content Analysis – General and with reference to social intelligence

ii) Content Enrichment – Its meaning, sources and process with reference to social intelligence.
iii) Lesson Planning – Writing objectives related to cognitive as well as psychomotor domain and their explanations, teaching points, student-teachers activities with reference to facets of social intelligences, evaluation and assignments.

iv) Simulated Teaching and Feedback – Simulated teaching episodes are arranged for each subject (Marathi, Science II and History) with time allotment of 15 hours, including simulated teaching (9 hours) and feedback (6 hours).

Simulated teaching for each subject implemented simultaneously having 3 hours with 2 hours of feedback.

Models of lesson plans for each subject are given at the end of Part – III of package.

**Appendices**

Appendices supporting to all parts are enclosed in this part. It consists –

i) Glossary for clarification of Terminology

ii) Set of good thoughts, idioms etc. supporting to development of social intelligence.

iii) Paper cuttings for group discussion activities

iv) Tests for evaluation of training

v) Selected bibliography for social intelligence.

### 3.3.2 Phase – II : DEVELOP

This phase is aimed to prepare first draft of package.

#### 3.3.2.1 Preliminary Part

Preliminary parts contains preface, index etc. It also provides the component wise objectives of the package and administration strategy in the form of flow chart.

The preface underline negligence of educational processes towards social domain of personality development due to its engagement in intellectual activities. It inquires the need and vitality of bridging the pedagogical practices to social intelligence. It also acknowledges the overall structure and functioning of package.

This phase aimed to prepare first draft of package brings into physical form. The process of defining the objectives, nature, components and parts of package assemble the skeleton of package. Preparation of draft is fulfilling the blood and flesh and breath to that skeleton to bring liveliness. First draft writing process consists following tasks.

- Preparing detail outline of package.
- Searching information regarding the points of outline.
• Identification and selection of appropriate information.
• Editing and organization of information for package.

The above said processes are described in brief.

3.3.2.2 Preparation of Detail Outline of Package

Part wise detail outline have been prepared by researcher. These outlines are discussed with experts and finalised for searching and collecting information.

3.3.2.3 Searching Information

Information regarding social intelligence, pedagogical content knowledge and training activities is searched from electronic as well as print sources. Various encyclopaedias and reference books have been referred to collect the information.

Table No. 3.5

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Article in Periodical and on Internet</th>
<th>Name of Author and Year</th>
<th>Related Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Teachers in depth content knowledge : Definition and checklist</td>
<td>Shulman, Lee (1987, p.4)</td>
<td>Pedagogical Content Knowledge</td>
</tr>
<tr>
<td>2.</td>
<td>Pedagogical Content Knowledge Taxonomies</td>
<td>Veal, William and Makinster, James (1999)</td>
<td>Pedagogical Content Knowledge</td>
</tr>
<tr>
<td>5.</td>
<td>Towards Social Intelligence in Autonomous Robotics</td>
<td>Duffy, Brian</td>
<td>Social Intelligence</td>
</tr>
<tr>
<td>7.</td>
<td>Pedagogical Content Knowledge for teaching concepts of nature of science</td>
<td>Ratcliffe, Mary</td>
<td>Pedagogical Content Knowledge</td>
</tr>
</tbody>
</table>
This sort of information is categorized regarding the objectives and parts of package.

### 3.3.2.4 Identification and Selection of Appropriate Information

The information is selected in relevance of objectives of package. It is identified as essential to package on the basis of following criteria –

i) Validity, ii) Authenticity, iii) Compressiveness, iv) Relevance, v) Research based, vi) Accuracy, etc.

### 3.3.2.5 Editing and Organization of Information

The information is accessed from diversified sources. Originally this information is presented in a different contexts. Therefore, its editing regarding objectives of package is essential. It is essential to organize that information in a homogenous manner.

Editing involves summarizing, rewriting or reshaping the information. Researcher has written that information in simple language and organized in systematic matter.

Various studies related to package development and their packages has been referred by researcher. Following studies found valuable regardance.


Researcher has finalised the draft by making correction as per the objectives of package. It is printed form package consisting three main parts.

### 3.3.3 Phase – III : EVALUATION

This phase has two main aspects –

i) Assessment by experts and

ii) Providing feedback for further action.

The package was given for examination to the experts in the area of Education, examined this package with the rating scale (Package Validity Scale) provided by researcher. It was a three points scale structured as follows :
Table No. 3.6
Component and Sub Component of Package

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Component of Package</th>
<th>Sub Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>Adequacy, In-depth</td>
</tr>
<tr>
<td>2</td>
<td>Writing/Syntax of Statements</td>
<td>Clarity and Style</td>
</tr>
<tr>
<td>3</td>
<td>Content</td>
<td>Coverage of micro points, proper selection, clarity, ease, sequential, scope, representativeness</td>
</tr>
<tr>
<td>4</td>
<td>Structure/Presentation</td>
<td>Components and sub components, Appropriate Headings, Titles and Sub titles, logical sequence of main and sub points, Homogeneity, length of statements</td>
</tr>
<tr>
<td>5</td>
<td>Explanations</td>
<td>Appropriate diagrams, Appropriate tables, Simplified explanation, Comprehensiveness, Conjunctions</td>
</tr>
<tr>
<td>6</td>
<td>Feedback</td>
<td>Appropriate activities</td>
</tr>
</tbody>
</table>

Experts were also requested to make descriptive comments and to give suggestions. Description of experts regarding aspects of package is given as –

Table No. 3.7
Description of Experts regarding Aspects of Package

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Aspect of Package</th>
<th>Description of experts rating of appropriateness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>Adequacy and depth of introduction is in an average</td>
</tr>
<tr>
<td>2</td>
<td>Construction of sentences</td>
<td>Writing style is suitable to audience in average standard</td>
</tr>
</tbody>
</table>
| 3       | Content                   | 1. Selection of content is adequate.  
2. Coverage of micro points is an average.  
3. Clarity and easeness of content is adequate in average.  
4. Scope and logical sequence of content is in adequate standard.  
5. Content has representativeness in adequate standard. |
| 4       | Structure/Presentation    | 1. Components and sub components are adequate in average.  
2. Headings and sub headings are appropriate in adequacy.  
3. Logical sequence and homogeneity is in adequate standard. |
| 5       | Explanations              | 1. Diagrams and tables are appropriate.  
2. Adequacy and comprehensiveness of content is averagely appropriate.  
3. Conjunctions connecting the statements as well as the points are appropriate. |
| 6       | Feedback                  | 1. Inter linkage of activities with content is appropriate. |
Overall result of the experts evaluation of package shows that the first draft of package is appropriate above the average and it may be improved upto mark of adequate appropriateness.

3.3.4 Phase – IV : REVISE AND DEVELOP

This phase is editing the package in regardance of evaluation by experts. It is focused on removal of errors and difficulties.

The errors scanned by experts and measures suggested by them for removal of the queries had been discussed with guide and following actions are taken to improve the package.

Table No. 3.8

Action Taken by Researcher for Improvement of Package with respect to Errors Scanned by Experts

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Aspect of Package</th>
<th>Queries/Suggestions</th>
<th>No. of Expert (out of 8)</th>
<th>Action taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>1. Target audience is not clear. Are they student-teachers or Teacher Educators?</td>
<td>8</td>
<td>Modified Package with respect to teacher educator as target audience</td>
</tr>
<tr>
<td>2</td>
<td>Writing of sentences</td>
<td>1. Sentences are constructed in more technical language? Is audience known to this?</td>
<td>7</td>
<td>Used simple language</td>
</tr>
<tr>
<td>3</td>
<td>Content i) Coverage of micro points</td>
<td>1. Clarity of technical terms is essential. 2. Lack of discussion regarding teaching methods/strategies. 3. Integration of social intelligence and PCK may be made more perfect.</td>
<td>7</td>
<td>Given one appendix for technical terms and also it is considered that these points are covered during regular B. Ed. course</td>
</tr>
<tr>
<td></td>
<td>ii) Selection of content &amp; easeness of content</td>
<td>1. Daily life examples should be inserted.</td>
<td>2</td>
<td>Inserted daily life examples</td>
</tr>
<tr>
<td></td>
<td>iii) Scope and Representativeness of Content</td>
<td>1. Which content from various subjects is suitable for social intelligence? And how? This should be mentioned in the package.</td>
<td>8</td>
<td>Mentioned the content from various subjects suitable for social intelligence</td>
</tr>
</tbody>
</table>

.....contd. on next page
With the help of Package Validity Scale eight experts in the area of Education, examined this package and suggestions or queries given by them are as below:

1. All (8) of the expert gives queries or suggestions that target audience is not clear, suitable content for social intelligence from each subject should be mentioned, and to use the picture or photograph related to social intelligence.

2. Out of eight experts seven experts suggested that sentences should use in simple world, clarity of technical term is essential, and there is a need to discuss the significance of social intelligence.

3. Feedback phase should be interactive and role of teacher should be clarified in regardance of social intelligence, suggested by six experts.

4. Two experts give suggestion that daily life examples should be inserted.

Experts examination has made good impact on the quality of package in relation to facial validity, adequacy of package, it also raised content and construct validity. (List of experts is attached in appendix No. 3).

Applicability and practicability of package can be tested only by implementing it in real situation. For this purpose the pilot study is one best option that has been adopted by researcher.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Aspect of Package</th>
<th>Queries/Suggestions</th>
<th>No. of Expert (out of 8)</th>
<th>Action taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Structure/Presentation i) Components &amp; Sub components</td>
<td>1. Significance of social intelligence is not discussed?</td>
<td>7</td>
<td>Discussed significance of social intelligence</td>
</tr>
<tr>
<td>5</td>
<td>Explanations</td>
<td>1. Is there any scope to use pictures or photographs?</td>
<td>8</td>
<td>Given one appendix for pictures related to lesson</td>
</tr>
<tr>
<td>6</td>
<td>Feedback</td>
<td>1. Is it possible to make more interactive? 2. Role of teacher should be clarified in regardance of social intelligence.</td>
<td>6</td>
<td>Clarified the role of teacher with respective places</td>
</tr>
</tbody>
</table>
3.3.5 Phase – V : EVALUATION AND REVISE

This phase consists of i) Pilot Study, ii) Discussion of observations of pilot study. Both the facts of the phase are given in details as follows:

3.3.5.1 Pilot Study

Researcher has employed the package with the help of three teacher educators on small group of teacher trainee and IXth standard pupils with the purpose of investigation of –

1. Comprehensiveness of terminology and instructions
2. Variables affecting experimentation
3. Time required for training
4. Practicability of activities.

Following strategy has been adopted for pilot study.

3.3.5.2 Strategy of Pilot Study

1. Social Intelligence Based Pedagogical Content Knowledge Package is given to three teacher educators.

2. Teacher Educators have trained one component of social intelligence to teacher trainees for development of lesson plan of related subject at IXth standard.

3. The problems, difficulties faced by the teacher educator regarding training were investigated through informal discussion and questionnaire.

3.3.5.3 Selection of Component for Pilot Study

In all three components of SI related to school subjects are selected for training by using major categories of strategies of training.

Table No. 3.9

Selection of Component from PCK Package for Pilot Study

<table>
<thead>
<tr>
<th>Subject</th>
<th>Interactive lecture</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>PPT</td>
</tr>
<tr>
<td>Marathi</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Science II</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>History</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

3.3.5.4 Structure of Questionnaire

The observations and other experiences during the pilot study are gathered by teacher educators through questionnaire structured as follows:
Table No. 3.10
Structure of Questionnaire

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Dimensions</th>
<th>No. of Items</th>
<th>Nature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Comprehensiveness</td>
<td>05</td>
<td>1. Listing the difficult terms or alternative nomenclature to terms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Listing ambiguous points.</td>
</tr>
<tr>
<td>2</td>
<td>Adequacy</td>
<td>01</td>
<td>1. Listing points where the additional information is required.</td>
</tr>
<tr>
<td>3</td>
<td>Instructions</td>
<td>02</td>
<td>1. Scaled response for clarity of instruction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Open ended response.</td>
</tr>
<tr>
<td>4</td>
<td>Relevance of activities</td>
<td>04</td>
<td>1. Scaled response.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Open ended response.</td>
</tr>
<tr>
<td>5</td>
<td>Tests</td>
<td>02</td>
<td>1. Scaled response.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Open ended response.</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

The sample of questionnaire is enclosed herewith in appendices No. 4.12.

The time schedule of pilot study is given here.

Table No. 3.11
Time Schedule of Pilot Study

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Task of the Pilot Study</th>
<th>Date</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Determination</td>
<td>1/2/2009</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>i) Determination of part of package for pilot study</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii) Determination of teacher educator</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii) Determination of teacher trainees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Package studied by teacher educator</td>
<td>3/8/2009</td>
<td>5 days</td>
</tr>
<tr>
<td>3.</td>
<td>Actual implementation of package on teacher trainee in pilot study</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>i) Implementation of component of first part</td>
<td>8/8/2009</td>
<td>2 day (2 hours per day)</td>
</tr>
<tr>
<td></td>
<td>ii) Implementation of component second part</td>
<td>10/8/2009</td>
<td>2 day (2 hours per day)</td>
</tr>
<tr>
<td></td>
<td>iii) Implementation of component of third part</td>
<td>12/8/2009</td>
<td>2 day (2 hours per day)</td>
</tr>
<tr>
<td>4.</td>
<td>Testing of teacher trainees</td>
<td>15/8/2009</td>
<td>2 hours</td>
</tr>
<tr>
<td>5.</td>
<td>Lesson guidance to teacher trainees</td>
<td>18/8/2009</td>
<td>2 day (2 hours per day)</td>
</tr>
<tr>
<td>6.</td>
<td>Simulated teaching</td>
<td>20/8/2009</td>
<td>2 day (2 hours per day)</td>
</tr>
</tbody>
</table>
3.3.5.5 Observations of Pilot Study

Following observations are found while carrying out the pilot study.

Table No. 3.12
Aspects of Observations Identified through Pilot Study

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Aspect of Observation</th>
<th>Details of Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Comprehensiveness</td>
<td>1. Difficulty of terms (page No. 7, 38)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Ambiguous points (page No. 49)</td>
</tr>
<tr>
<td>2</td>
<td>Adequacy</td>
<td>1. Illustration of components of SI is not sufficient.</td>
</tr>
<tr>
<td>3</td>
<td>Instructions</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Relevance of activities</td>
<td>1. Samples/Illustrative of activities are required.</td>
</tr>
<tr>
<td>5</td>
<td>Tests</td>
<td>1. Guidelines for scoring and interpretation are not mentioned.</td>
</tr>
</tbody>
</table>

With the help of above observations of pilot study, researcher had taken action in next phase 'Revise'.

3.3.6 Phase – VI : REVISE

The 'Revise' phase is vital for making final form of package with the help of guide.

3.3.6.1 Discussion with Guide

The result of pilot study have been communicated with guide and probable measures for improvement were discussed. following actions are taken due to observations and experiences of pilot study.

1. Glossary of terminology is prepared to enclose with package to improve comprehensiveness of package.
2. Explanations are improved with additional references and daily life examples.
3. Time schedule for implementation is prepared.
4. Models of activities are added in appendices section.
5. Guidelines of scoring and interpretation of tests are formed.
6. Strategies for implementation of package have been defined.

3.3.6.2 Final Form of Package

1. The package has been characterised through a long process from defining the objective, components etc. to pilot study. The each phase of development has contributed it to enrich in both dimension quality and practicability. Through this process it came to final form. This final from is shown in the Figure No. 3.7
The external appearance and internal appearance of package is shown as –

1. Tentatively, each activity completed within 1-2 hours and set of activities for any components have been implemented within maximum 5 hours. Part and component wise time schedule was prepared on the basis of this experience.
2. Implementation of package is feasible with available resources and trainer or trainee doesn't require any special source of knowledge in regardance of social intelligence rather than the proposed package.

3. Tests are appropriate to judge the degree of success of training of package.

4. Observations, insights and experiences gained through pilot study have boosted standard of package in both sense – quality and practicability.

This chapter deals with the whole process of development of pedagogical content knowledge package. The PCKP has been finalised through a long process of six phase from 'Define' to 'Revise' and development. How each phase of development of PCKP has contribute to enrich in both dimensions quality and practicability is thoroughly discussed in this chapter.

In the next chapter problem is discussed with methodological point of view.