

# **Development of Self-Instructional Materials in Educational Statistics for M.Ed Programme Through Distance Mode**

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Now a days distance education is being imparted along with conventional form of education. Capacity to accommodate greater number of students has made distance education more popular. The concept of distance education has been so much popularised that a large number of developed and developing countries like India, Pakistan, Sri Lanka, Canada, China, The Federal Republic of Germany, Indonesia, Japan, Thailand, Spain and United Kingdom have been running open universities successfully. The main reasons and need for the expansion of distance teaching universities are : a) to satisfy the need of people who could not get higher education because of vocation, family and other social commitments, b) to provide a wide range of optional courses and c) to provide more sophisticated means for dissemination of knowledge alongwith economical use of educational resources by mediated teaching.

This distance education is essentially learner-based in terms of entry qualification, choice of subjects, place and time for learning, curriculum, evaluation, etc. It is the learner who has to shoulder the major responsibility in learning through this system. The implication is that a motivated learner needs the help of the teacher but only to a limited extent. In order to make the efforts of the motivated learner fruitful, steps are being taken to provide them with basic necessities/facilities to learn. Self-instructional materials (SIMs) in distance education are a major step in this direction. Utility and effectiveness of SIM in distance education has been investigated by various investigators in India as well as abroad. (Perraton, 1973; Sansanwal, 1978; Jenkins, 1979; Holmberg, 1986; and Rowntree, 1986). Sansanwal (1978) stated that SIMs have an important role to play in Distance Education. In distance education system, the study material has to perform the functions of a live-teacher. These materials should be self paced, flexible, auto-instructional, economical in time and effort, more interesting and exciting and may be developed within the available resource. Besides information, SIM also provide the learner study guide, discussion hints and references.

Thus we analyse that SIM is a learner-oriented instruction in which learning takes place without requiring the physical presence of teachers. It is based on the principles of programmed learning which in turn are founded on the concept of operant conditioning given by Skinner in 1954. Programmed instruction is a process of arranging material to be learned in a series of small steps designed to lead a learner through self-instruction

from what he knows to the unknown of new and more complex knowledge and principles. Some features of distance learning self-instructional units which have been derived from the programmed instruction are objectives, division of content into steps, frequent feed back, self-check questions and answers.

Now question arises how to design, write and produce self-instructional print material of appreciable quality. It is a strenuous task and at the same it is different from production of text-books.

SIM is prepared in such a way that the learner does not face any hurdles while learning the subject. It is one of such media in distance education which teaches efficiently, effectively and individually. Moreover, it sustains the motivation to learn, makes the learning affair not only easy but stimulating as well. Keeping these objectives into consideration and promoting effective learning in statistics this study was aimed at.

### **Objectives**

1. To develop a self-instructional unit in print in the area of statistics pertaining to "Sampling" for M.Ed. distance learners.
2. To study the reactions of learners towards SIM and bring out possible modifications therein.

### **Method and Procedure**

**Sample :** The sample of study consisted of a group of fifteen M.Ed distant learners of the Directorate of Distance of Education, M.D. University, Rohtak.

**Tool :** A reaction 'scale' was prepared to measure the reactions/perceptions of learners towards pre-liminary draft of SIM. The first draft of the scale consisted of 30 items. This 30 items scale was given to subject experts. They were asked to give their expert advise, views and criticism. On the basis of their views, the irrelevant and inappropriate items were deleted from the reaction scale. In the final draft there were sixteen (16) items with Yes/No alternatives.

### **Development and Evaluation of Self-Instructional Print Material**

For preparation of pre-liminary draft of SIM, the investigator selected M.Ed distant learners. These were selected because they were well-versed with the distance mode of education and the importance of print material in their learning process.

The next step of the lesson was selection of the topic on which SIM was to be prepared. Sampling unit-11 Ird (Types and Techniques, Probability, and Non-Probability Methods of Sampling) from the syllabus of Paper IIIrd of M.Ed of M.D. University,

Rohtak i.e. Methodology of Educational Research and Statistics was selected. The unit was chosen because the investigator was teaching this subject to distant learners and being continuous in touch with distant learners, full involvement of the learners was assured. At the same time, this topic was useful for research scholars engaged in other disciplines of science and humanities. Once the level of instruction and the unit was decided, the preliminary draft of the self-instructional print material was prepared by keeping in view the salient features of SIM. The entire unit was divided into three parts i.e. Beginning a unit, Main body of the unit and Ending.

### **Beginning a Unit**

The main function of this first part of the unit was to give decisive orientation to learners. Introductory sections included the statement of objectives in behavioural terms, structuring of the unit and introduction to the unit.

i) **The objectives of the unit** were stated in behavioural terms to enable the learners to know what they must learn or achieve in that unit. At the same time, these objectives stated in behavioural terms also provide guidance to distant learners in planning and helped them in deciding assessment techniques.

ii) **Structuring of unit** given at the beginning of the unit was detailed itemisation of the content divided into sections and sub-sections. It helped learners to overview the text and locate relevant points efficiently. Moreover, the logically arranged sections and sub-sections of the Sampling unit made the content more accessible. The sections and sub-sections of the unit were numbered as 3, 3.1, 3.2, 3.3, and so on because the present unit was at number '3' in the syllabus. The left hand digit denoted the unit number i.e. 3 and digit on the right hand side of the point denoted the section number e.g. 3.1 the first section of unit 3. Numbering beyond two points were not used. A schematic representation of the design of Sampling unit is shown in Fig. 1 as under :

#### **UNIT III SAMPLING**

##### **Objectives :**

##### **Structure :**

- 3.1 Introduction
- 3.2 Advantages of Sampling over complete enumeration
- 3.3 Types of Sampling
- 3.4 Probability Sampling Procedures

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|-----|--|
| 3.5 | Non-Probability Sampling Procedures                          |
| 3.6 | Distinction Between Probability and Non-Probability Sampling |
| 3.7 | Let Us Sum Up  |
|     | Model Answers  |
| 3.8 | Key Words  |
| 3.9 | Further Readings   |

**Fig. 1.** A Schematic representation of the unit SAMPLING

iii) **Introduction to under line the Unit** explained the content of sampling and related it with previous units and previous knowledge of the learners. Structural, Thematic and Guidance component of Introduction was taken care of in this part.

### **Main Body of the Unit**

The main body of the unit includes a sequence of texts explaining the sampling and its types and self-assessment questions.

### **Ending a Unit**

The last part of the unit, consisted of summary and further readings, was a sort of repetition of what had already been discussed in the unit. It was quite useful for the learners because it helped them to check whether they had completed all the necessary learning activities, understood the content and learned all the important points.

Last step in the development of SIM were its Evaluation and Analysis. Evaluation and analysis of pre-liminary draft of SIM was made on the basis of the reactions/ perceptions of the learners measured by 'Reaction Scale', consisted of sixteen items with Yes/No alternatives.

### **Administration**

Preliminary draft of SIM and 'Reaction Scale' was given to a group of fifteen M.Ed distant learners. They were given seven days to go through the unit. After seven days, they were asked to give their reactions in Yes/No against each item given in Reaction scale.

### **Evaluation**

The evaluation of the preliminary draft of SIM was done on the basis of the percentage of Yes/No responses. (Given in Table 1)

**Table I : Learners Reaction Towards SIM.**

Item No.	Percentage of Responses	
	Yes	No
1	100	---
2	13	87
3	53	47
4	80	20
5	74	26
6	80	20
7	87	13
8	80	20
9	87	13
10	20	80
11	13	87
12	87	13
13	13	87
14	74	26
15	80	20
16	13	87

From the reaction of the students, it was found that the title and structure of unit had been presented in accordance with the topic. Also, 100 percent distance learners agreed that the title of unit was clear and it gave them an idea as to what the unit was about. As many as 87 percent learners were of the view that the structure of SIM was presented with itemised sections and sub-sections. These sections were presented in order of the occurrence of the content.

Analysis revealed that objectives of the unit were not defined clearly in behavioural terms. 47 percent learners were of this view. On the basis of their reaction, objectives were re-written in behavioural terms by using descriptive, discriminative and motor performance verbs.

The SIM was found to be present in a style in which the learners were able to go through it without external support. 80 percent distance learners considered that the content was self explanatory and conceptually clear.

A large percentage of learners i.e. 87 percent observed that SIM provided the

learners directions, hints and references. 80 percent learners were of the view that the content was supported with appropriate illustrations, examples and flow diagrams. Easy explanations and sequential development in which the material was presented, was found to be useful in self-learning.

The SIM had been written for the learners who remain off-campus for most of their time and it was just like-a-live teacher. 87 percent learners agreed that material was highly encouraging as it related their knowledge to familiar situations.

The SIM consisted of many self-check exercises. However, 80 percent learners considered that study material did not make provisions for feedback. Self evaluation in the form of check your progress could not help them in reinforcing their learning. 87 percent learners opined that the self check questions were less in number.

On the basis of their opinion, more questions were added in self-check exercises so that they could guide the learners and help them in going on right track. Moreover, it will help them in reinforcing their learning.

In the end of SIM, glossary of key words was given. It appeared that number of key words were not adequate. Infact, only 13 percent learners considered that the key words were sufficient in number. More key words were added from the text provided in SIM.

In all 74 percent learners opined that instructions given in SIM were precise. However, 20 percent learners found some difficulty in going through the material. They required help for the same from outside.

The SIM had been written according to the level of instruction with conversational language. However, 87 percent learners felt that the language used in SIM was not simple and clear. On the basis of their observation, the SIM was rewritten with the help of short and simple sentences. The active vocabulary and simple grammer were used to explain different ideas clearly in a conversational and friendly language.

By keeping all these responses of the learners in mind, further improvements were made in SIM. In this way, the final form of SIM was prepared.

### **Conclusions and Implications**

This SIM on Sampling is beneficial for distant learners as well as to researchers who do not have access to formal system of instruction and want to pursue academics in the field of statistics as a subject. Also it provides insight to the researcher who are engaged in research in various disciplines of science and humanities.

After going through the SIM on Sampling, the researchers will be in a position to adopt the appropriate sampling technique and a representative sample on which the precision of the study will depend.

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