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PREPARATION OF SELF-LEARNING MATERIAL IN THE SUBJECT OF INFORMATION AND COMMUNICATION TECHNOLOGY AT M. ED. LEVEL ON THE TOPIC OF "OPERATING SYSTEMS" AND STUDY OF ITS EFFECTIVENESS

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ABSTRACT:

Development of educational technology emphasizes the change in traditional methods of teaching. Effectiveness of any system depends upon the quality of product. In classroom teaching, one of the important measures of product is realization of objectives. Similarly, individualization instructions, self-paced learning are the demands of modern education. The main objective of this study was to prepare a self learning material in the subject of Information and Communication Technology at M. Ed. level on the topic of operating systems and to study the effectiveness of self-learning material. The sample comprised of about 50 M. Ed. students. The single group pre-test and post-test research design was adopted in the present study. A teacher made achievement test was the tool to judge the performance of the M. Ed. students. 't' value was used for measuring effectiveness of the self-learning material. Self-learning material was prepared step-wise, i.e. (1) Need assessment of the students. (2) Selection of the topic. (3) Content analysis (4) Framing the objectives (5) Making introduction (6) Explanation of teaching points. (7) Summary (8) New terms or concepts (9) Assignments (10) References for detail reading. (11) Preparation of booklet. (12) Evaluation of booklet. (13) Finalization of booklet.

As a result at learning throughout the use of self-learning material the student was scored significantly higher (at the 0.01 level) in the post-test as compared to the pre-test.

KEYWORDS*: educational technology , self-paced learning , Communication Technology.*

INTRODUCTION :

We are living in the economy of globalization, privatization and liberalization. In this economy, competition is bound to be the part and parcel of our life. In the present higher education, we are facing two problems. One is to increase enrolment of the students in the higher education and secondly while increasing the quantity it should maintain quality. But unfortunately, we are emphasizing only on quantity and not much on quality. Self-learning is a way to maintain quality in the higher education because it has many advantages to increase quality in education.

In the self-learning method, we can involve the students in the teaching learning process. It is new way for the students because maximum teacher's traditional method, known as lecture method, is used in the higher education. Self-learning method its several benefits like students get enough time for their study and get appropriate instructions.

(2) Need of the study:

Each student is the gift of the nation. It is known as wealth of the nation also. Each student has certain potentials of capacity differently. In our traditional way of teaching it has no place as a whole.

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Self-learning is a method in which student can learn according to his capacity and get success in his/her life.

Sometimes teacher's teaching may be diverted from their content base. That creates problems of students to their learning's, student don't get proper points as they expect. Now the students are examination oriented. They need unit-wise and point-wise explanation in their classroom. Self-learning is prepared on the basis of unit-wise and point-wise explanation and that is why they prefer to read self-learning rather than attending the classroom.

As already mentioned, there is lack of qualified teachers in most of colleges and it affects on students quality in their classroom. Self-learning material is very much useful in this situation for their career development.

Last but not the least whenever student gets success in his/her study he/she can motivate to do something more than this success. So for increasing student's motivation it is need of such self-material for their future academic development.

(3) The statement of the problem:

Preparation of Self-Learning Material in the subject of Information and Communication Technology at M. Ed. level on the topic of "Operating Systems" and study of its effectiveness

(4) Operational Definitions:
(i) Preparation:

A software had to be prepared in the subject of Information and communication technology at M. Ed. level on the topic of "Operating Systems". The software was prepared in print form (booklet).

(ii) Self-learning:

Self-learning material means a material specially prepared in the form of booklet on certain criteria and evaluated by subject experts that the students can learn through their pace and time to understand the content without teacher on the topic of operating systems to the M. Ed. Students.

(iii) Information and Communication Technology:

Means a compulsory subject taught at M. Ed. level session 2017-2018 onwards.

(iv) Operating Systems:

A topic which is included in the subject of Information and Communication Technology.

(v) Effectiveness:

Effectiveness of the self-learning material means the significant positive difference in marks obtained by the sample students in their pre-test and post-test.

(5) Objectives:
(i) To prepare a self-learning material in the subject of Information and Communication Technology at M. Ed. level on the topic of "Operating Systems".
(ii) To study the effectiveness of self-learning material prepared in the subject of Information and Communication Technology at M. Ed. level on the topic of "Operating Systems".

(6) Hypothesis:
(a) **Directional Hypothesis**: As a result of learning through the use of self-learning material on the selected unit in Information and Communication Technology, the student will score significantly higher marks (at the 0.01 level) in the post-test as compared to the pre-test.
(b) **Null Hypothesis**: There is no significant difference in the student's pre-test and post-test scores in the achievement test as the result at learning through self-learning material on the selected unit.

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(7) Significance of the study:
(i) M. Ed. students can clear their ideas of Information and Communication Technology. (ii) Another advantage is that the self-learning material will enable the M. Ed. students to study at their own pace and time. (iii) Self-learning material will useful in the students of other post-graduate courses under the faculty of education, e.g. Philosophical and Sociological foundation of education, Psychological foundation of education, Research methodology, Teacher education and Guidance and Counseling etc.

(8) Sampling Method: Incidental sampling method was used for this research study.

(9) Sample: Comprising of 50 M. Ed. students studying in the 2017-2018 onwards batch at Centre for Higher Studies Jabalpur were taken as a sample for this study.

(10) Research Design:
The single group pre-test and post-test research design was adopted in the present study.

(11) Research Tool:
        A teacher made achievement test was the tool to judge the performance of the M. Ed. students.

(12) Statistical Technique:
        't' value was used for measuring effectiveness of the self-learning material.

(13) Methodology: Step-wise preparation of self-learning material (See table).

(I) Preparation of self-learning material in print form (booklet):
        In the present research, self-learning material is prepared in the subject of Information and Communication Technology on the topic of 'Operating Systems'. The steps depicted in diagram are followed. The investigator himself has prepared this self-learning material with the help of references. Some pictures were collected from internet and references in the subject of Information and Communication Technology. A news paper cutting also was used for relevant information.

Table No.1 : Step-wise preparation of self-learning material

(1) Need assessment of the students.
(2) Selection of the topic.
(3) Content Analysis
(4) Framing the objectives.
(5) Making introduction.
(6) Explanation of teaching points.
(7) Summary
(8) New terms or concepts
(9) Assignments
(10) References for detail reading.
(11) Preparation of booklet.
(12) Evaluation of booklet.
(13) Finalization of booklet.

(II) Objectives of self-learning material:
        The self-learning material on the topic of 'Operating Systems' was prepared with following objective;
* To enable the students to:
(1) Introduce various concepts and features in operating systems.

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(2) Create folders.
(3)Various shortcuts and their application.
(4)Knowledge about the internet.
(5) Memory management.
(6) Security and privacy.

(III) Types of questions:

Table No.2:

S. No.	Types of questions	Marks
1.	Fill in the blanks	05
2.	Long Answer	18
3.	Short Answer	12
4.	Definitions	09
5.	Distinguish between	06
Total		50

(IV) Content Analysis:

After having various types of questions, the content analysis of the topic was prepared as below;

Table No.3:

Sl.	Content	Marks
1.	Concept and Features	10
2.	Creating Folders	08
3.	Shortcuts and their application	12
4.	Internet Explorer	06
5.	Memory Management (RAM, ROM)	07
6.	Security and Privacy	07
Total		50

(V) Division of marks according to objectives:

Table No.4:

Objectives	Marks
Knowledge	14
Comprehension	18
Application	18
Total	50

(VI) Division of Marks according to the questions:

Table No.5:

Types of Question	Marks
Objective	05
Short Answers	27
Essay Type	18
Total	50

(VII) Validation and Evaluation:

(a) **Validation**: Validation means checking their 'content' and the treatment given to the content are technically correct. Throughout the preparation, some experts have given valuable suggestions and

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according to their suggestions the material was modified and revised. Finally, the revised version was prepared.

(b) **Evaluation**: The first stage of evaluation is the preparation of self-learning material or pilot study. Prepared self-learning material was given to the 5 M. Ed. students of Centre for Higher Studies , Jabalpur for their comments. As per their suggestion, the self-learning material was revised. Same procedure was adopted from subject experts and the self-learning material was finalized . The types of questions and its marks were allotted as under-

(VIII) Achievement Test:

After having content analysis, the achievement test was prepared as below;

This achievement test includes objective type questions of 5 marks short answer type question of 27 marks and essay type questions of 18 marks.

In this test marks were reserved for testing knowledge – 6 marks were kept for testing comprehension and – 18 marks were kept to application level questions.

Table No.6:

Question No.	Types of Questions									Marks
	Objective			Short-Answers			Essay			
	K	C	A	K	C	A	K	C	A	
01	05									05
02				09						09
03					06					06
04									18	18
05				12						12
				21	06				18	
Total	05			27			18			50

(14) Effectiveness of the self-learning material (booklet):

The answer sheets of the students were assessed and scores tabulated.

Null Hypothesis:

There will be no significant increase at 0.01 level in the post-test marks as compared to the pre-test marks in the achievement test as a result of self-learning material.

*Number of students (N) = 50

	Pre-Test	Post-Test
Mean (M)	M1 = 15	M2 = 50
Std. Dev. (cr)	o-i = 6.80	o-2 = 5.45
= Correlation	r = 0.49	

(1) To calculate the standard error of deviation-
D = V0.6508 o-D = 0.8874
(2) Difference between means (D):
D = M1 – M2 = 15 – 50 = 35
(3) t value calculated:
2H   66.73
o-D   0.8488 5
Degree of freedom:
$\sigma M1 = \dfrac{\sigma_1}{\sqrt{N}} = \dfrac{6.10}{\sqrt{50}} = \dfrac{6.10}{8} = 0.7625$

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$$\sigma M_2 = \frac{\sigma_1}{\sqrt{N}} = \frac{5.53}{\sqrt{50}} = \frac{5.53}{8} = 0.6912$$

df = N-1 = 50 – 1, df = 49

$$SED = \sigma D = \sqrt{(\sigma M_1)^2 + (\sigma M_2)^2 - 2\sigma.\ \sigma M_1\ \sigma M_2}$$

$$= \sqrt{(0.76)^2 + (0.69)^2 - 2 \times 0.49 \times 0.76 \times 0.69}$$

For the degrees of Freedom 49 from the table the value for t = 2.39 / 15.

CONCLUSION:

Hence, the obtained 't' value 46.73 exceeds the t critical value 2.39 at 0.01 level. The null hypothesis is rejected and directional hypothesis is accepted.

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