

Comparative Study of Effectiveness of Modular and e-lecture Approaches For Learning Educational Research Concepts by P.G. and post P.G. students in the Context of Class Level

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ABSTRACT

The purpose was to study the effect of Treatment, Class level and their interaction on Achievement of Research Skill in Educational Research by taking Pre-Achievement of Research Skill in Educational Research as Covariate. The present study was Quasi- experimental in nature, designed on the lines of Non-Equivalent Control Group Design by Campbell and Stanley. The sample comprised of 130 students, out of these 91 were P.G. students and 39 were post P.G. students studying in different Institutions of Jammu and Kashmir. Out of 130 students, 45 P.G. students and 20 Post P.G. students constituted the Modular group while as 46 P.G. students and 19 Post P.G. students constituted the e-lecture group. Some common topics were taught to both the groups using different strategies of teaching viz., module and e-lecture. The Achievement of Research Skill of P.G. and Post P.G. students was assessed with the help of Achievement of Research Skill Test in Educational Research developed by the researcher. The data were analysed with the help of Two Way ANCOVA. The findings of the study were: (i) Class Level was found to have no significant influence on Achievement of Research Skill in Educational Research when Pre-Achievement of Research Skill was taken as Covariate. (ii) Interaction between Treatment and Class Level was found to have no significant influence on Achievement of Research Skill in Educational Research when Pre-Achievement of Research Skill was taken as Covariate.

I. RATIONALE OF THE STUDY

Since the principle of individualized instruction evolved, a number of attempts were made to find the effectiveness of various methods of instructions in context to support the individualized learning to overcome the individual differences. Module is one of the most popular forms of self instructional material. Many researches have been conducted abroad as well as in India which were developmental and experimental in nature. Researches conducted abroad as well as in India are stated under the captions given below:

- Effectiveness of module
- Effectiveness of other forms of self instructional material

Studies related to effectiveness of module which were conducted abroad as well as in India are given below:

Sharma (1982); Mollykutty (1991); Joshi (1999); Ahuja (2002); Chopra (2002); Shetty (2004); Londhey (2007); Maharana (2011)

All the above researches found modular approach of learning more effective than traditional mode of learning. Some researchers compared modular approach with other instructional mode and found as an effective mode of instruction than other mode of learning.

Studies related to effectiveness of other forms of instructional material:

Studies related to effectiveness of other forms of instructional material which were conducted abroad as well as in India are as follows:

Manocha (1990); Mahapatra (1993); Prabhakar (1995); Moghe (1996); Ojha (1996); Danikhel (1997); Joshi (1997); Nath (1998); Antonisamy (1999); Kohal (1999); Zyoud (1999); Singh (2001); Thaker (2001); Mukherjee (2001); Shinde (2002); Dubey (2004); Das (2005); Kohli (2005); Rupsingh (2006); Tourani (2006); Asthana (2007); Parashar (2007); Shinde (2007); Gupta (2008); Lulla (2008); Gopal (2009); Sharma (2009); Tiwari (2012).

All the above studies provided the findings that the learning instructional material was found superior to traditional method of learning.

The researches done in the field of module reflects that module is an effective means of instruction but most of the researches were centered on achievement and reactions. The modules were developed in different subjects at different levels. Most of the modules were developed for training purposes and sometimes these were not related to the curriculum.

Different researchers studied the effectiveness of module with regard to different variables like self concept, personality, attitude, self perception which had an impact on achievement. Thus, it is clear from the above description that a very little work has been done in this area, "development of module" in the area of Research Methodology and Statistics. Most of the studies were conducted abroad. Because of many years ago the foreign universities have adopted self learning mode many years ago. These countries are well developed in the field of education. They have very flexible system of education. With the development of distance education and open learning system concepts, requirement of structured learning material increased. Open University like IGNOU (Indira Gandhi National Open University) developed material on different subjects but they were not research based. To get best results and make distance education more feasible it is necessary to develop research based module.

All these facts motivated the researcher to develop a module on fundamentals of Research Methodology and Statistics for research students in social science (including education) and study of its effectiveness in terms of achievement with selected variables.

II. OBJECTIVES

The objective of the study was:

1. To study the effect of Treatment, Class Level and their interaction on Achievement of Research Skill in Educational Research by taking Pre-Achievement of Research Skill in Educational Research as Covariate.

III. HYPOTHESES

Hypothesis of the study was:

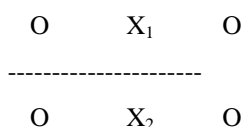
1. There is no significant effect of Treatment, Skill and their interaction on Achievement of Research Skill in Educational Research by taking Pre-Achievement of Research Skill in Educational Research as Covariate.

IV.DELIMITATIONS OF THE STUDY

1. Module was developed in English language only.
2. The study was limited only to students of Education and social science disciplines.
3. The module was developed on some common selected topics prescribed in PG/Post PG Students syllabi of Research Methodology and Statistics.
4. Research Concepts were limited to selected concepts such as:
 - Hypothesis testing
 - Parametric and Non-Parametric tests
 - Scales of Measurement
 - Tests of difference between means of two /k samples test
 - Paired samples and two Independent samples test
 - Non-Parametric counterpart of Independent and Correlated t-tests.

V.RESEARCH DESIGN

The present study being experimental in nature was designed on the lines of non equivalent control group design. Following was the layout of the design (Symbolic representation).



Where, X₁ and X₂ denote Modular and e-lectures Treatments respectively. O before X₁ (Modular Treatment) and X₂ (e-lecture Treatment) denotes pretest and O after X₁ (Modular Treatment) and X₂ (e-lecture Treatment) denotes post test. The dotted line denotes the two groups were not made equivalent before the experimentation. Before beginning the experiment, the Achievement Test I and Achievement Test II on Educational Research Concepts developed by the investigator was administered to the students of both groups i.e., Modular group as well as e-lectures group. Both the Modular and e-lecture groups were also administered Locus of Control tool in between. At the end of the experiment, the Achievement Test I and Achievement Test II were again administered on both Modular and e-lecture groups.

VI. SAMPLE

The study was experimental in nature. The sample constituted of PG and Post PG students studying in different Institutions of Jammu and Kashmir, namely, South Campus, University of Kashmir, Central University of Kashmir, Nowgam Bypass Srinagar, Main Campus, University of Kashmir, Hazratbal Srinagar. The Universities were selected purposively. Then two groups were formed, namely, Modular group and e-lecture group on the basis of random assignment of Treatments to the half of the students of each Institute. The subjects of both PG and Post PG Course constituted the Modular group as well as the e-lecture group. The sample comprised of 130 students, out of these 91 were PG students and 39 were post PG students. Out of 130 students, 45 PG students and 20 Post PG students constituted the Modular group while as 46 PG students and 19 Post PG students constituted the e-lecture group. Both males and females were the part of the sample. The medium of the instruction was English only. The details of the sample are given in table 1.1 which is given below:

Table 1.1: Treatment/Group wise and class level wise distribution of sample:

Class level	Treatment		Total
	Modular group	e-lecture group	
PG	45	46	91
Post PG	20	19	39
Total	65	65	130

VII. TOOL

7.1 Achievement of Research Skills Test in Educational Research (ARSTER):

Achievement of Research Skills Test in Educational Research was practical in which students were asked to complete the given tasks based on some Research Skills to be done on the computers and off the computers to assess the Research Skill of the subjects of present study. The Test comprised of 10 questions/tasks on the basis of Research Skills listed below:

- ❖ Formulation of Research Objective, Null Hypothesis and Directional Hypothesis.
- ❖ Data entry
- ❖ Testing assumptions underlying Statistical test
- ❖ Running a statistical test
- ❖ Editing the output
- ❖ Interpreting the output

The Achievement of Research Skill of students was assessed on the basis of these tasks. Each task was carrying 5 marks. All questions carried equal marks. There was no negative marking. The language of the test was English only.

VIII. PROCEDURE OF THE STUDY

The study was experimental in nature. It was conducted on P.G. and Post P.G. students studying in different Institutions of Jammu and Kashmir, namely, South Campus, University of Kashmir, Central University of Kashmir, Nowgam Bypass Srinagar, Main Campus, University of Kashmir, Hazratbal Srinagar. As stated before, there were two groups and both were experimental groups. The name of first experimental group was Modular group and the name of second experimental group was e-lectures group. The subjects of both P.G. and Post P.G. Course constituted the Modular group as well as the e-lecture group. The sample comprised of 130 students, out of these 91 were PG students and 39 were post PG students. Out of 130 students, 45 PG students and 20 Post PG students constituted the Modular group while as 46 PG students and 19 Post PG students constituted the e-lecture group. Both males and females were the part of the sample. The medium of the instruction was English only. The permission of the concerned Heads of above stated teaching departments was obtained before starting the experiment. At the beginning students were oriented about the experimentation with the objective of establishing rapport with them. The students of experimental group first and experimental group second were provided orientation about Modular approach and e-lectures approach respectively. Moreover, proper instructions were given to them to learn effectively.

8.1 Pretesting

Achievement of Research Skills Test in Educational Research was administered on the experimental group first as well as on the experimental group second. There were 10 questions in the Achievement of Research Skills Test in Educational Research and the duration of the Test was 60 minutes.

8.2 Treatment

After pretesting, the Treatment was given to the students of both experimental groups. Students of experimental group first were told about Modular approach while as Students of experimental group second were told about the e-lectures approach in Educational Research, which they were supposed to watch during the Treatment process.

The students of first experimental group were given Modules/ Capsules to learn one by one and they were allowed to discuss and ask questions during the class time. All the students were provided a notebook and a ball point pen for jot down the important points during the class time. The Treatment was given 2 hours per day. The Treatment process was continued for 20 days. After the completion of part of Treatment in class, each student of the experimental group first was asked to revise all Capsules on different topics in Educational Research for the next one day. Thus each cycle was completed for a topic, the entire process taking up about 20 days excluding pre and post testing, holidays, revision day and administration of other tools.

The students of second experimental group were allowed to watch e-lectures on selected topics one by one. They were also permitted to discuss and ask questions during the e-lectures. They were permitted to stop the e-lectures at any point of time they liked and if needed, they were allowed to repeat any portion of e-lectures as many times as they wished. All the students were provided a notebook and a ball point pen for jot down the important points during the e-lectures. The Treatment was given per day depending upon the duration of e-lecture. The Treatment process was continued for 20 days. After the completion of part of Treatment in class, each student of the experimental group second was asked to view of e-lecture on the different topics in Educational Research for the next six days. Thus each cycle was completed for a topic, the entire process taking up about 20 days excluding pre and post testing, holidays, revision days and administration of other tools.

Furthermore, both treatments were given per day. Modular Treatment was given in Ist half of the day while as e-lecture Treatment was given in IInd half. Same procedure was followed at other two experimental places. Thus, the complete process of experiment took 60 days.

8.3 Post-testing

After the completion of experimental process, Achievement of Research Skills Test in Educational Research was administered on Modular group and e-lecture group. The Items in the Test were same as in Pretest. The scoring of the tool was done as per the scoring guide developed by the researcher for Achievement of Research Skills Test in Educational Research.

IX. DATA ANALYSIS

The data was analysed by using Two Way Analysis of Covariance (ANCOVA) for the present objectives.

X.RESULTS AND INTERPRETATION

10.1: Effect of Treatment, Class Level and their interaction on Achievement of Research Skill in Educational Research by taking Pre-Research Skill in Educational Research as Covariate.

The objective was to study the effect of Treatment, Class Level and their Interaction on Achievement of Research Skill in Educational Research by taking Pre-Achievement of Research Skill in Educational Research as Covariate. There were two levels of Treatment, namely, Modular Group and e-lecture Group. Similarly, there were two levels of Class Level, namely, PG and Post PG. The data were analyzed with the help of 2x2 Factorial Design ANCOVA with unequal cells size. The results obtained are given in table 1.3 below:

Table 1.3: Summary of 2x2 Factorial Design ANCOVA with Unequal Cells Size of Achievement of Research Skill in Educational Research by Taking Pre-Achievement of Research Skill in Educational Research as Covariate.

Source of variation	df	SS _{y,x}	MSS _{y,x}	F _{y,x}	Sig.
Treatment	1	2744.91	2744.91	103.67	.000
Class Level	1	9.66	9.66	.36	.547
Treatment× Class Level	1	34.08	34.08	1.29	.259
Error	125	3309.65	26.48		
Total	128				

From the above table, it is evident that the adjusted value of F for Treatment on Achievement of Research Skill in Educational Research is 103.67 with df = (1, 127), whose p-value is less than 0.01. Therefore, it is significant at 0.01 level of significance. In this context, the null hypothesis that “there is no significant difference between mean scores of Achievement of Research Skill in Educational Research of the Modular group and the e-lecture group by taking Pre- Research Skill in Educational Research” as covariate is rejected. Thus the Modular group and the e-lecture group differ in their mean scores of Achievement of Research Comprehension in Educational Research when pre- Achievement of Research Skill in Educational Research was taken as covariate.

In order to find out which group students have performed significantly better, the adjusted means of Modular Group and e-lecture Group were compared, which are given in table 1.3 below:

Table 1.3: Summary of Adjusted Means of Achievement of Research Skill in Educational Research of Modular Group and the e-lecture Group

Treatment	Adjusted Mean
Modular Group	32.00
e-lecture Group	21.19

From the above table, it is evident that the adjusted mean score of Achievement of Research Skill in Educational Research Modular group is 32.00 which is significantly higher than that of the e-lecture Group whose mean score is 21.19. It, may, therefore be concluded that the adjusted mean score of Achievement of Research Skill in Educational Research of Modular group is significantly higher than that of e-lecture Group. Hence, Treatment (Modular Approach) has been effective in terms of Achievement of Research Skill in Educational Research as

compared to e-lecture approach when Pre-Achievement of Research Skill in Educational Research was taken as Covariate.

From the above table, it is evident that adjusted F value for Class Level on Achievement of Research Skill in Educational Research by taking Pre- Achievement of Research Skill in Educational Research as Covariate is .36 with $df = (1, 125)$, whose p-value is .547 which is greater than 0.05. Therefore, it is not significant at 0.05 level of significance. In the light of this the null hypothesis that “there is no significant effect of Class Level on Achievement of Research Skill in Educational research by taking Pre-Achievement of Research Skill in Educational Research as Covariate” is not rejected. It reflects that mean scores of Achievement of Research Skill in Educational Research of PG and Post PG students by taking Pre-Achievement of Research Skill in Educational Research as Covariate do not differ significantly. It may, therefore, be concluded that Class Level was found to have no significant influence on Achievement of Research Skill in Educational Research when Pre-Achievement of Research Skill was taken as Covariate.

From the above table, it is evident that adjusted F value for the Interaction between Treatment and Class Level on Achievement of Research Skill in Educational Research by taking Pre- Achievement of Research Skill in Educational Research as Covariate is 1.29 with $df = (1, 125)$, whose p-value is .259 which is greater than 0.05. Therefore, it is not significant at 0.05 level of significance. In the light of this the null hypothesis that “there is no significant effect of Interaction between Treatment and Class Level on Achievement of Research Skill in Educational research by taking Pre-Achievement of Research Skill in Educational Research as Covariate” is not rejected. It reflects that mean scores of Achievement of Research Skill in Educational Research of PG and Post PG students by taking Pre-Achievement of Research Skill in Educational Research as Covariate do not differ significantly. It may, therefore, be concluded that Class Level was found to have no significant influence on Achievement of Research Skill in Educational Research when Pre-Achievement of Research Skill was taken as Covariate.

XI.FINDINGS AND DISCUSSION

The findings obtained from the interpretation of results above are as follows:

1. Class Level was found to have no significant influence on Achievement of Research Skill in Educational Research when Pre-Achievement of Research Skill was taken as Covariate.
2. Interaction between Treatment and Class Level was found to have no significant influence on Achievement of Research Skill in Educational Research when Pre-Achievement of Research Skill was taken as Covariate.

The objective was to study the effect of Treatment on Achievement of Research Skill in Educational Research of the Modular group and the e-lecture group by taking Pre-Achievement of Research Skill in Educational Research as Covariate. The Module on Educational Research Concepts (Statistical Concepts) in Educational Research was studied on the basis of Achievement of Research Skill in Educational Research by taking Pre-Achievement of Research Skill as Covariate. The Modular Approach on Educational Research Concepts (Statistical Concepts) in Educational Research was found to be effective as well as superior to e-lecture method when groups were matched on Pre-Achievement of Research Skill in Educational as Covariate. The present finding is supported by Sharma (1982), Mollykutty (1991), Joshi (1999), Kohal (1999), Ahuja (2002), Chopra

(2002), Shetty (2004), Londhey (2007), Gopal (2009) and Maharana (2011) who found learning Module was significantly effective than learning through traditional method. Further students who were exposed to Modular approach on Educational Research Concepts (Statistical Concepts) in Educational Research performed better than the students who were exposed to e-lecture approach. The students studied through Module Approach learn at their own pace as they were allowed to discuss any point or difficulty among themselves as well as with the teacher and researcher but this opportunity were lacking with the students of e-lecture group. Since Research Skill is practical in nature. So it requires more examples with clarification of concepts and doubts then and only then students may perform better in Research Skill. One more benefit for the students of Modular group was that important terms related to topics in every capsule were highlighted with sufficient explanation. The students of Modular group have enough opportunity to actively practice as they were supposed to carry out the different tasks / activities related objective writing, hypothesis framing, writing interpretation and writing suitable output while as this opportunity was not with the students of e-lecture group. Students showed more interest in solving the practice examples as they could know the answers which were given in the end of every capsule of the module. It provided feedback to the attempts made by the students but this opportunity was also missing with the students of e-lecture group. The students remained active throughout the experimental process for learning different Research Skills as Research Skill is one of the important component in writing the Dissertation/Thesis. Moreover, Module on Educational Research Concept in (Statistical Concepts) Educational Research created interest in students as the Module contains all the important topics which are in every respect compulsory for PG and Post PG students. Module being in written form was kept simple and easy to understand. The above reasons might be responsible for the present finding.

When data were analysed related to this objective, the Class Level was found to have no significant influence on Achievement of Research Skill in Educational Research when Pre-Achievement of Research Skill in Educational Research was taken as Covariate. This finding is supported by Tiwari (2012), who found Educational Qualification was found to have no significant Influence on Reasoning. It indicates that both PG and Post PG students can equally benefitted from modular and e-lecture approaches. The ability of learning through modular approach and e-lecture approach was not dependent on Class Level. Students of PG and Post PG worked hard irrespective of their Class Level to develop their Research Comprehension in Educational Research. Further, PG and Post PG students may use both of the methods of teaching for the enhancement of Achievement of Research Skill in Educational Research. The methods of teaching and environment in every respect during the whole experimental process were same for both PG and Post PG students. This might be the reason for the present finding.

Moreover, when data were analysed related to the same objective, the influence of interactional effect between Treatment and Class Level was found to be independent on Achievement of Research Skill in Educational Research when Pre-Achievement of Research Skill in Educational Research was taken as Covariate. Thus, PG and Post PG students can equally use modular and e-lecture approaches for the enhancement of their respective Achievement of Research Skill in Educational Research.

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