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Workbook in Geography and its effect on Students' Achievement.

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Abstract: *The present study was conducted to find out the effect of Workbook in Geography on achievement of the students. Pre-test and post-test equivalent group design or pre-test and post-test control group design was taken up for the experiment. There were 160 students, randomly selected, 80 from schools of rural area and 80 from urban schools. Developed workbook in Geography for 6th Class students was experimented upon. For experimentation two groups of students were taken, one experimental treatment group and another control treatment group. Experimental group students were exposed to the experimental treatment. Results revealed that achievement was higher among the students who received experiment or treatment. There was no environmental (area) difference in this context. On the other hand there is positive correlation between application of workbook and achievement. Implications were highlighted in terms of policy formulations and teachers and students.*

Keywords: *Workbook and Achievement*

I. Background

Geography is as old as mankind. Man had to think of environment, food and shelter from the very beginning of his existence on the Earth.

The geographical discipline is currently overflowing with a number of concepts and there are many branches of geography. "The perspective of present day geography is as wide as the earth, as large as life itself". (O.P.Varma, E.G.Vedanayagam)

Geography is a unifying science. The raw-material, it deals with is derived largely from other sciences and studies, it deals with the material in its own way seeking and rediscovering the interrelationship between man and the phenomena. Geography is a bridge among different subjects. It cuts across every school subject and is correlated with every school subject. A large part of geography is natural science and the remaining part of it is social science and the two are closely related. Because of its relation with social and natural sciences, it equally appeals to a scientist and to a student of social science. (O.P.Varma and E.G. Vedanayagam)

It is observed that, in the present day geography is of vital importance even to a man in the street. Its study is useful for general people, students, administrators, industrialists, planners etc. It has universal applicability. It relates to international understanding, multi-cultural concerns and environmental concerns. Its scope is very vast.

Its study broadens the mental outlook of students and enables to offer a critical attitude to world problems.

Keeping in view its utilitarian and educational significance the study of geography (as a separate discipline) from the Upper Primary stage has been emphasized. Geography is grouped in social studies and is taught as a compulsory subject in schools.

It was also enquired about geography teaching programme in various parts of the state through administration of questionnaire for teachers (316 No's) and was convinced that the schools in all parts of the state did not have minimum facilities required for teaching geography. Most of the schools were without laboratories, were not equipped with adequate aids, furniture and rooms for children. In many schools there was only one teacher to manage more than three classes at a time. About the educational status of the teachers, they did not have any specialized knowledge to teach geography. Except a few schools students were not given chance to learn geographical facts through excursion. Use of modern instructional techniques and materials for teaching had not reached its expectation. Chalk and talk method was prevalent. Students simply imagine geographical

phenomena and memorise geographical facts. The figures given in the text book and the corresponding explanations given by the teachers appeared to be inadequate for the learners' understanding.

As it is difficult to replace the existing text book, the deficiency could be reduced by providing additional input in the form of certain activities, which might help to provide up-to-date information, clarify doubts and help to develop clear and correct conception in the minds of the students about certain facts and principles already read. In the context of lack of adequate facilities available in schools, it was also hoped that the workbook as an additional component will help in establishing the facts and ideas in the subject content in the minds of the students. The workbook helped to develop the ability to understand geographical phenomena through varieties of exemplary situations and new ways of explanations.

In the present study workbook is used as a device to help the learners to learn through the method, that is Learning by Doing and it helped them to have practices in reading, thinking, judging and writing activities in continuation to the various contents in geography. The present study is an attempt to know the effect of workbook on the achievement of students of Class-VI.

Objectives:

The present study aimed at to study the following objectives.

(1) To develop workbook in geography on the basis of the content units of geography textbook for the students of Class-VI as prescribed by the Board of Secondary Education, Odisha.
(2) To experimentally validate and study the effectiveness of the workbook in terms of students' achievement.

Hypothesis:

Students learning through workbook would show higher achievement on the post-test compared to the achievement on the pre-test given before exposure to the workbook.

II. Design:

The present study is one developmental-cum-experimental work. Pre-test, post-test equivalent group design, also called pre-test post-test control group design was selected for the experiment. In this design experimental and control groups were generally kept as identical as possible, with the exception that experimental group was exposed to the experimental treatment. Pre-test and Post-test were administered to the groups. Table-1 explains the design of the experiment.

Table – 1Design of the Present Study

Units	Experimental Group			Control Group		
	Pre-Test	Treatment	Post- Test	Pre-Test	Treatment	Post- Test
1.	O_1	T_1	O_2	O_3	T_2	O_4
2.	O_1	T_1	O_2	O_3	T_2	O_4
3.	O_1	T_1	O_2	O_3	T_2	O_4
4.	O_1	T_1	O_2	O_3	T_2	O_4
5.	O_1	T_1	O_2	O_3	T_2	O_4
6.	O_1	T_1	O_2	O_3	T_2	O_4
7.	O_1	T_1	O_2	O_3	T_2	O_4

Where O_1 Pre-test for experimental group
O_3 Pre-test for the control group
T_1 Treatment for the experimental group i.e. Text book followed by workbook.
T_2 Only text-book for control group.
O_2 Post-test for experimental group

O_4 Post-test for control group.

The same procedure was repeated to all the units in both rural and urban samples.

Sample:

160 students belonging to class-VI (80 urban and 80 rural) belonging to Upper Primary schools of Cuttack district were taken as sample. 80 urban and 80 rural students, in each case, were divided into two equivalent groups having 40 students in each group.

Tools:

(1) Workbook was developed on seven topics of geography textbook for the students of Class-VI taking contents of the subject into consideration.

(2) Criterion Tests on each topic of geography book were developed for measuring students' achievement. Each test contains 25 items for which one hour time was given. All the questions are of objective type and carry equal (one) mark.

Procedure:

Subjects were selected on random basis after checking their previous achievement and teachers' rating. However two groups (experimental and control group) were identical. Equal number of students was selected (80 from urban and 80 from rural area).

As per objective-1, workbook was prepared basing on the contents of the textbook. Subject-matter was presented in a variety of ways. Learners were made to go through a variety of activities. Continuous feedback was provided in terms of correct answer by which the children were able to develop confidence during learning. Learners were helped to go in small steps according to their pace of progress. Facts and figures were properly co-ordinated. In some places extra figures were given. Important facts were written in bold letters and sometimes it was written with words 'please remember', 'please learn repeatedly'. Language through which the contents were provided was written in such a simple and appealing way that while going through workbook, the students felt the presence of somebody with whom they were responding to.

The workbook was intended to encourage self-study. Attempts were made to create such situations where interest among the students were created and maintained throughout the work book.

In both urban and rural schools, students of Class-VI were divided into two sections. Sec-I was treated as experimental group and Sec-II was regarded as control group. As per objective-II, a comparison of the achievement scores of students taught through the text-book along with workbook and with that of the students taught through the text-book was made. Thus the treatments were:

Treatment – 1

Here the teacher taught the topic from the text-book first. Then pre-test and after that students were given chance to study through workbook individually. The teacher was just a guide and friend for the students. In the workbook along with reading, the students had to see the figures and answer the questions.

Treatment – 2

This was the traditional approach of teaching by the classroom teacher. To sustain the interest of students after the pre-test, the control group students were given this treatment. To avoid the disinterest of the control group students, similar discussions were made in the line of the workbook without using it.

After completion of experiment in the school the criterion tests were scored and achievement of the students who learnt geography through the workbook along with textbook and that of those learning geography through textbook alone were recorded separately for different programmes. Those were analyzed by applying the techniques of mean, SD and t-test. The results are presented in following tables.

Table – 2: Mean, S.D and t-value of pre-test results of Group-A (Experimental) and Group-B (Control) students (urban)

Content Units	Groups	Mean	SD	t-value	Level of Significance
U_1	A	10.7	2.67		
	B	10.7	2.95	00	-
U_2	A	9.45	1.71		
	B	9.25	2.29	0.626	-
U_3	A	8.85	2.4		
	B	8.95	2.37	-0.265	-
U_4	A	8.1	1.49		
	B	8.1	1.65	00	-
U_5	A	9.1	2.28		
	B	9.1	2.8	00	-
U_6	A	8.1	1.49		
	B	8.7	1.66	-0.002	-
U_7	A	8.0	1.76		
	B	8.1	2.29	0.312	-

N = 40 in each case

Table-2 shows the unit-wise distribution of mean, standard deviation and t-value of experimental and control group students of urban area when the pretest was given. In each case, the t-values in all units were not significant either at 0.05 level or at 0.01 level. This indicated that the difference in mean of the performance of the students of experimental and control group was not significant, which further showed that there existed no significant difference between the two groups, so far as their achievement in geography was concerned. Hence the pre-test administered to the students confirmed the equivalency of the groups. So these two groups were treated as parallel.

Table – 3: Mean, S.D and t-value of post-test results of Group-A (Experimental) and Group-B (Control) students (urban)

Content Units	Groups	Mean	SD	t-value	Level of Significance
U_1	A	18.3	2.83		
	B	12.3	2.66	13.8	.01
U_2	A	17.0	3.31		
	B	13.3	2.36	8.22	.01
U_3	A	19.1	4.05		
	B	12.4	1.6	13.7	.01
U_4	A	17.0	3.28		
	B	12.15	2.4	10.77	.01
U_5	A	17.0	2.91		
	B	11.85	2.22	12.8	.01
U_6	A	19.55	2.47		
	B	12.3	1.66	21.83	.01
U_7	A	17.7	3.12		
	B	12.9	1.88	11.79	.01

N = 40 in each case

From Table-3, it is observed that in urban areas the post-test performance of the students of experimental group (A) was higher to the performance of the control group (B). More clearly it was observed that the corresponding scores and corresponding standard deviation were much higher compared to that of control group. In each case, it was observed that the t-values in all the 7 units were significant at 0.01 level. This

indicated that the students of experimental group (the students who were going through the workbook) had shown better performance over the students reading through the textbook alone (control group). It can be concluded that the workbook has positive influence over the textbook.

Table – 4: Mean, S.D and t-value of pre-test results of Group-C (Experimental) and Group-D (Control) students (rural)

Content Units	Groups	Mean	SD	t-value	Level of Significance
U_1	C	9.8	3.11		
	D	9.7	2.85	0.212	-
U_2	C	9.9	2.93		
	D	10.0	2.17	-0.245	-
U_3	C	8.65	2.12		
	D	8.9	2.52	-0.679	-
U_4	C	8.1	2.28		
	D	8.1	2.14	-0.00	-
U_5	C	9.1	2.12		
	D	8.8	1.44	1.04	-
U_6	C	9.7	1.61		
	D	9.45	1.71	0.954	-
U_7	C	9.7	1.61		
	D	10.3	2.95	-1.604	-

N = 40 in each case

From Table-4, it is observed that in each unit, the difference in performance of the students of experimental group-C and control group-D the t-value was not significant at 0.05 level. It indicated that there existed no significant difference between the performances of the students in both the groups in the pre-test conducted on rural sample. So both the groups were treated as equivalent.

Table – 5: Mean, S.D and t-value of post-test results of Group-C (Experimental) and Group-D (Control) students (rural)

Content Units	Groups	Mean	SD	t-value	Level of Significance
U_1	C	18.5	3.57		
	D	11.5	2.68	14.02	0.01
U_2	C	17.8	2.68		
	D	13.0	3.31	10.08	0.01
U_3	C	17.7	2.96		
	D	13.1	1.65	12.169	0.01
U_4	C	19.5	3.35		
	D	12.5	2.36	15.28	0.01
U_5	C	20.8	2.19		
	D	12.3	1.40	26.55	0.01
U_6	C	18.0	3.7		
	D	12.25	3.11	10.64	0.01
U_7	C	17.45	3.3		
	D	12.15	2.4	11.62	0.01

N = 40 in each case

From Table-5, it is observed that in rural areas the post-test performance of the experimental group-C was higher as compared to the performance of the control group-D.

More clearly it was observed that the mean achievement scores and the corresponding standard deviation were much higher than to that of the control group except unit-2. Further coming to the test of significance between the means, it was found, that the t-value of the students was significant at 0.01 level in all the units, which justified that the students of experimental group using the workbook had shown better performance over the students of experimental group using the workbook had shown better performance over the students studying through the textbook alone.

Table – 6: Mean, S.D, t-value of the pre-test results of Group-A (Experimental) and Group-C (Experimental) students (urban and rural)

Content Units	Areas	Mean	S.D	t-value	Level of Significance
U_1	Urban	10.7	2.67		
	Rural	9.8	3.11	1.965	-
U_2	Urban	9.45	1.71		
	Rural	9.9	2.93	1.187	-
U_3	Urban	8.85	2.4		
	Rural	8.65	2.12	0.558	-
U_4	Urban	8.1	1.49		
	Rural	8.1	2.28	00	-
U_5	Urban	9.1	2.28		
	Rural	9.1	2.12	00	-
U_6	Urban	8.1	1.49		
	Rural	9.7	1.61	-6.53	0.01
U_7	Urban	8.0	1.76		
	Rural	9.7	1.61	-6.48	0.01

N = 40 in each case

The table-6 shows the unit-wise distribution of mean, standard deviation and t-value of experimental group students of urban (A) and rural (C) areas when the pre-test was given. In each case the t-value in all the 7 units were not significant either at 0.05 level or at 0.01 level except U_6 and U_7. In unit-6 and unit-7 the difference in performance of the students in Group-A and Group-C, the t-value was significant at 0.01 level. An overall consideration on it indicated that the groups of subjects taken for the study were almost equivalent. The students in rural and urban areas were almost similar, in respect of their achievement in geography.

Table – 7: Mean, S.D, t-value of the post-test results of Group-B (Control) and Group-D (Control) students (urban and rural)

Content Units	Areas	Mean	S.D	t-value	Level of Significance
U_1	Urban	12.3	2.66		
	Rural	11.5	2.68	1.89	-
U_2	Urban	13.3	2.36		
	Rural	13.0	3.31	0.66	-
U_3	Urban	12.4	1.6		
	Rural	13.1	1.65	-2.73	0.01
U_4	Urban	12.15	2.4		
	Rural	12.5	2.36	-0.93	-
U_5	Urban	11.85	2.22		
	Rural	12.3	1.4	-1.53	-
U_6	Urban	11.9	1.77		
	Rural	12.25	3.11	-0.875	-
U_7	Urban	12.9	1.88		
	Rural	12.15	2.4	2.205	0.01

N = 40 in each case

From the table-7 it is observed that in each unit, the performance of the students of control group-B and control group-D the t-value was not significant either at 0.05 level or at 0.01 level except in U_3 and U_7. The t-values of the performance of the students in U_3 and U_7, t-values were significant at 0.01 level. On overall consideration it can be concluded that in case of post-test results of control group (urban) and control group (rural), there existed no significant difference between the performances of the students. Further it was concluded that the students of urban and rural areas were almost identical in respect of their achievement in geography which indicated that environment has no effect on students' achievement in geography.

Therefore the workbook had positive bearing upon the performance of the students in urban and rural areas.

From the table-3 and table-5 it was observed that achievement of the students learning geography through the workbook in addition to the textbook was higher than that of the students learning through the textbook alone. In all the cases the obtained t-value was found significant in all the units at both 0.05 level and 0.01 level, both in urban and rural situations.

It can be concluded that the experimental group students who were exposed to the workbook along with textbook showed better understanding of geographical facts in comparison to that of the students of the control group, who were taught only through the textbook. It can be said that the workbook was found effective in improving achievement among students. So the hypothesis is accepted and retained. The workbook proved its success over the textbook on the achievement of students in geography at the elementary stage.

To know the effect of workbook, students, teachers of schools (where experiment was done) were interviewed. Their reactions were given below:

Reaction of students

Students of experimental group were interviewed by the researcher on various aspects of the workbook. The observations on different aspects were:

1) Language of workbook

About 98% students were of the opinion that the language used in the workbook was more convincing than that used in the text-book. All 80 students reported that when they were going through the workbooks, they felt as if the book was talking to them.

2) Sequence of the topics

It was stated by 95% students that the concepts were presented in the workbook in sequential order. It helped them to understand the subject matter clearly.

3) Figures and diagrams

About the figures and diagrams all the students were of the opinion that the figures and diagrams were clearly and accurately presented to clarify their doubts. It helped them for better understanding of geographic facts and concepts.

4) Writing answers

Reacting to the writing of the answers to the questions in the space provided in the workbook, it was reported by 95% students that it was a simultaneous activity which they had enjoyed. While they were reading the workbook they had novel experience of answering questions in the same book. It rather created interest in reading and responding to the questions.

Reaction of the Teachers

Twenty teachers (10 each from urban and rural) from Cuttack district expressed their reactions.

All the teachers who were interviewed were of the opinion that the workbook is an essential material for effective teaching of geography at the elementary stage. Most of them expressed their opinion that the use of workbook helped students to develop ability of critical thinking. 98% of the teachers preferred the use of workbook in addition to the textbook as far as scientific understanding and achievement of the students were concerned.

The workbook had shown success on a limited sample selected for the study. The researcher feels that in similar situations it will show its effectiveness. Better performance of experimental group students in the criterion test and effectiveness of workbook implies that this new instructional strategy should be incorporated in other school subjects in large scale and supplied to the students for instructional purpose. The teachers should be specially trained on the development and use of workbook.

Attempts may be made to develop workbooks of different styles. The possibility of writing workbooks for the computer assisted programme may be attempted. It was also observed that self-learning materials were accepted and liked by the students and teachers. Attempts may be made by school administrators, the curriculum designers and examining bodies to develop self-learning material for the betterment of the students.

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