THE INTERNATIONAL JOURNAL OF HUMANITIES & SOCIAL STUDIES

An Experimental Study of the Relative Effectiveness of two methods of Instruction - Personalized System of Instruction and Conventional Classroom Instruction in under graduate Educational Psychology General Course

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Abstract:
The study was designed to investigate the effect of two teaching methods - Personalized system of instruction (PSI) and conventional classroom instruction (CCI) on achievement and retention of two hundred and forty (240) college students of the first year general course under university of Calcutta. Sample students were divided into two groups (Experimental group and Control group) of one hundred and twenty (120) students each. Each group was further divided into three sub groups (High achiever, Medium achiever and Low achiever)of forty(40) students each. All groups were made equivalent on the basis of their Higher secondary grand total which was tested through analysis of variance. Experimental groups learnt the study materials through PSI mode and Control group was taught the same study materials through CCI mode. Pre-Test-Post-Test -control group experimental design was used to conduct this study. The data was analyzed by using T-test. Results showed that there is significant difference between the Means scores of Experimental group and Control group so far as achievement and retention after six weeks were concerned. PSI mode was more effective than CCI mode for high, medium and low achievers.

***Key words**: Personalized System Of Instruction, Conventional Classroom Instruction, Achievement, Retention*

1. Introduction

Personalized system of instruction or the Keller plan is an individually paced, student-tutored and mastery- oriented instructional method. Dr. Keller and his three associates- Sherman , Azzi & Bori, evolved PSI in 1963. The method was first conceived at Columbia University and implemented in practice in Keller's Psychology course at the University of Brasilia. This system of instruction was largely being applied in Higher education.

Keller(1968) identified five basic features of his method which are as follows :

- The go-at-your own-pace feature, which permits a student to move through the course at a speed commensurate with his ability and other demands upon his time.
- The unit perfection requirement for advance, which lets the student go ahead to new materials only after demonstrating mastery of that which preceded it.
- The use of lectures and demonstrations as vehicles of motivation, rather than sources of critical information.
- The related stress upon the written word in teacher-student communication; and finally
- The use of proctors, which permits repeated testing, immediate scoring , almost unavoidable tutoring, and a marked enhancement of the personal social aspect of the educational process.

By contrast, Conventional Classroom Instruction (CCI) is meant as "front of the class teaching" where the teacher verbally or with the help of some teaching aids and materials teaches the whole class at the same time.(Lundgren, 1972).As a method it is essentially verbal and one way. The students do not usually interact with the teacher to alter, refine or pace the message (Kozma,1978).

Educational psychology is generally taught and learnt through conventional mode in undergraduate colleges of Calcutta University. But the use of such method is no more sufficed. New knowledge is being created rapidly and old knowledge is also getting discarded very fast. In Fact, generation of knowledge is so accelerated that a person is to learn and re-learn throughout his life. Society is becoming an ever-learning society where emphasis is on “how to learn” that is self learning and not on time bound instruction.

In this study, the researcher tried to investigate the relative effectiveness of two methods of instruction on students’ achievement and retention after six weeks.

2. Review of Literature

Tyree (2013) implemented the Keller plan teaching method at law school in 1990. The method was applied on 130 students at the University of Sydney. Results showed that nearly all students are attracted to the method because of the advantages of self-pacing and of knowing "where they are" in the course.

Rae (2006) found that the Keller plan for self-paced learning had been shown to be effective in enhancing learning, especially in basic science and mathematics but it is little used nowadays.

Kulik et.al (1979) summarized results from 75 studies on PSI in USA. A total of 61 out of these 75 studies compared the final examination average of students taught the same content in PSI and conventional classes. In 57 of the 61 studies, final examination scores were higher in the PSI class and in 48 of the studies; the examination results difference between PSI and conventional classes was large enough to be statistically reliable. In no case, the examination average of conventional class was significantly higher than that of PSI class. In the typical PSI class, the average final examination score was 74% and in the typical conventional class the average score was 66%.

Keller and his three associates (1964) offered the first PSI course in teaching psychology at the newly established University of Brasilia. The results of the study revealed that in comparison with courses taught more conventionally, PSI demanded a much greater understanding of basic concepts. It generates greater feelings of achievement, greater enjoyment, improves study habits, increases one's desire to hear lectures, makes attitude towards testing more positive and diminishes worry about final grades.

A review of evaluative research on the Keller plan establishes the following points.

- The Keller Plan is an attractive teaching method to most students. In every published report, students rate the Keller plan much more favorably than teaching by lecture.
- Self Pacing and Interaction with tutors seem to be the features of the keller courses most favored by students.
- Several investigators report higher-than-average withdrawal rates for their Keller sections. The conditions that influence withdrawal and procrastination in Keller courses have been studied, and it seems possible to control procrastination and withdrawal through course design.
- Content learning (as measured by final examinations) is adequate in Keller courses. In the published studies, final examination performance in Keller sections always equals and usually exceeds performance in conventional lecture sections.
- Students almost invariably report that they learn more in PSI than in lecture courses and also nearly always report putting more time and effort into the Keller courses.

3. Objectives

To find out the relative effectiveness of two instructional strategies (PSI and CCI) for teaching Educational Psychology in under graduate general course with respect to:

- Gain in achievement of the learners and
- Retention after 6 weeks.

4. Hypothesis

- H_0. There is no significant difference between the mean scores of two High Achiever groups in their gain in achievement.
- H_1. There is significant difference between the mean scores of two High Achiever groups in their gain in achievement.
- H_0. There is no significant difference between the mean scores of two Medium Achiever groups in their gain in achievement.
- HI. There is significant difference between the mean scores of two Medium Achiever groups in their gain in achievement
- H_0. There is no significant difference between the mean scores of two Low Achiever groups in their gain in achievement.
- H_1. There is significant difference between the mean scores of two Low Achiever groups in their gain in achievement
- H_0. There is no significant difference between the mean scores of two High Achiever groups in their retention after 6 weeks.
- H_1. There is significant difference between the mean scores of two High Achiever groups in their retention after 6 weeks
- H_0. There is no significant difference between the mean scores of two Medium Achiever groups in their retention after 6 weeks.
- H_1. There is significant difference between the mean scores of two Medium Achiever groups in their retention after 6 weeks
- H_0. There is no significant difference between the mean scores of two Low Achiever groups in their retention after 6 weeks.
- H_1. There is significant difference between the mean scores of two Low Achiever groups in their retention after 6 weeks

5. Material and Methods

5.1. Sample for this Study

Sample for this study comprises of 240 girl students of BA first year general course. They were drawn from Basanti Devi College (Government aided),Kolkata on the basis of randomized matched sampling. Almost all the students belong to same age group of 18-19 years and coming from similar socio-economic background. 240 students were grouped into two. An experimental group of 120 students and a control group of 120 students. Each group was further divided into three subgroups-High Achiever(40),

Medium Achiever(40) and Low Achiever(40). The equivalence of the two groups and their sub groups were confirmed by analysis of variance.

5.2. Design

In order to compare the two methods of instructions, the pre-test-post-test-control group experimental design was used to conduct this study

5.3. Tools Used

- Modified form of Kuppuswammy's socio-economic status scale part 1 was used.
- Formative evaluation in the form of self-assessment tests was developed by the investigator with the help of the subject experts and was used in the study.
- Summative Evaluation in the form of criterion reference test and Retention test were developed by the investigator with the help of the subject experts and was used to measure whether the students have achieved instructional objectives after undergoing a sequence of instructions.

6. Procedure of Experimentation

The experiment was conducted in three phases. These are:

6.1. Instructional Phase

In this phase criterion reference test (pre-test) was administered on both the groups (experimental and control) for measuring their previous knowledge, if any, of the selected topics of educational psychology. After this, the students were provided orientation and instructions about their respective instructional strategies. The students of the experimental group were given study material of educational psychology general course and were requested to read the instructions before going through the units. The students of the control group were made familiar about the instructional objectives of the unit.

6.2. Execution Phase

During this phase, the experimental groups learn the units through PSI mode and the students of the control group were taught the units through lecture method.

6.3. Evaluation Phase

After completion of the units by both the groups, criterion reference test was administered on both the groups to measure gain in achievement of the students. The retention test was also applied on both the groups. Scores are obtained to see if there is any significant difference between the mean score of experimental and control groups regarding gain in achievement and retention.

7. Results

To compare gain in achievement and retention of the students of two groups and their sub groups, mean scores were analyzed using T-test and the results were presented in Table -1 thru 6 below.

7.1. Gain in Achievement of Students of two groups

Groups	N	Mean	SD	T-value	Level of Significance
Experimental Group (PSI)	**40**	**26.43**	**1.26**	**10.45**	**0.05**
Control Group (CCI)	40	22.05	2.33		

Table 1: T-test of High Achiever groups (Post-Test)

Table-1 shows that the calculated t-value for "High Achiever group" is 10.45 which is significant at 0.05 level. This finding rejects the null hypothesis (H_0) and the alternative hypothesis (H_1) is accepted which states that there is significant difference between the mean scores of two " High Achiever" groups in their gain in achievement.

Groups	N	Mean	SD	T-value	Level of Significance
Experimental Group (PSI)	40	26.00	1.13	19.16	0.05
Control Group (CCI)	40	16.43	2.95		

Table 2: T-test of Medium Achiever groups (Post-Test)

Table-2 shows that the calculated t-value for "Medium Achiever group" is 19.16 which is significant at 0.05 level. This finding rejects the null hypothesis (H_0) and the alternative hypothesis (H_1) is accepted which states that there is significant difference between the mean scores of two " Medium Achiever" groups in their gain in achievement.

Groups	N	Mean	SD	T-value	Level of Significance
Experimental Group (PSI)	40	25.48	1.77	18.23	0.05
Control Group (CCI)	40	14.10	3.53		

Table 3: T-test of Low Achiever groups (Post-Test)

Table-3 shows that the calculated t-value for "Low Achiever group" is 18.23 which is significant at 0.05 level. This finding rejects the null hypothesis (H_0) and the alternative hypothesis (H_1) is accepted which states that there is significant difference between the mean scores of two " Low Achiever" groups in their gain in achievement.

7.2 Retention in Students of two groups after Six weeks

Groups	N	Mean	SD	T-value	Level of Significance
Experimental Group (PSI)	40	18.35	1.71	13.71	0.05
Control Group (CCI)	40	13.10	1.72		

Table 4: T-test of High Achiever groups (Post-Test)

It is evident from Table-4 that the calculated t-value for "High Achiever group" is 13.71 which is significant at 0.05 level. Therefore the null hypothesis is rejected and the alternative hypothesis is accepted. High Achiever Group (PSI) can retain the subject matter more than the control group.

Groups	N	Mean	SD	T-value	Level of Significance
Experimental Group (PSI)	40	17.63	4.09	13.38	0.05
Control Group (CCI)	40	7.80	2.21		

Table 5: T-test of Medium Achiever groups (Post-Test)

It is evident from Table-4 that the calculated t-value for "Medium Achiever group" is 13.38 which is significant at 0.05 level. Therefore the null hypothesis is rejected and the alternative hypothesis is accepted. Medium Achiever Group (PSI) can retain the subject matter more than the control group.

Groups	N	Mean	SD	T-value	Level of Significance
Experimental Group (PSI)	40	13.15	1.42	16.30	0.05
Control Group (CCI)	40	5.40	2.65		

Table 6: T-test of Low Achiever groups (Post-Test)

It is evident from Table-4 that the calculated t-value for "Low Achiever group" is 16.30 which is significant at 0.05 level. Therefore the null hypothesis is rejected and the alternative hypothesis is accepted. Low Achiever Group (PSI) can retain the subject matter more than the control group.

8. Conclusion

In conclusion, it can be said that Personalized System of Instruction was found to be more effective than Conventional Classroom Instructions so far as gain in achievement and retention of the students were concerned. Research studies revealed that personalized system of instruction can be successfully applied as an alternative and improved instructional method for medium and low achievers.

9. References

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10. Declaration

It is declared that this research paper is written by Dr Aditi Sarkar. The material in this paper is original and has not been published elsewhere in part or full and the same has not been submitted for publication in any other books or journals.