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A STUDY OF EFFECTIVENESS OF EXPERIMENTAL TEACHING METHOD ON THE EDUCATIONAL ACHIEVEMENT OF SUBJECT OF SCIENCE

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Abstract:

Science means "specialized knowledge," and Technology is the art of presenting that knowledge to students through processes and methods based on scientific principles. For the holistic development of students, textbook knowledge alone is not enough; a scientific outlook, approach, and practical work are also essential. Teachers play a crucial role in fostering this holistic growth, awakening experimental and research-oriented methods within students, and guiding them toward the right milestones.

Today's students gather many times more information through various mass media than they do through classroom study. Keeping the student at the centre, practical work should be conducted in schools in such a way that it is effective and cultivates a sense of curiosity toward experimentation.

In an educational environment, if a child is taught only through lectures, they may remember for a while and then forget. However, if Experimental work is involved, they can remember it for a lifetime; and if they perform the experiment themselves, they can understand and retain it naturally. Thus, in this research paper, the investigator has attempted to test the effectiveness of two different methods to measure educational achievement in the subject of Science.

Keywords: EXPERIMENTAL TEACHING METHOD, EDUCATIONAL ACHIEVEMENT, SCIENCE SUBJECT

Introduction:

The 21st century is the era of the knowledge explosion. Today, students acquire more information through various mass media platforms than they do in school. However, this information is only transformed into true scientific knowledge when a student learns it through their own efforts. In other words, when children are provided with experiential (practical) education, they learn extensively from their surroundings. Furthermore, they learn to work with meticulousness, perseverance, and precision in practical life.

To keep the explosion of knowledge in a subject like Science alive and practical—and to ensure better understanding and application—this study utilizes the Experimental Teaching Method. Establishing a strong foundation through basic concepts and practical work is essential in subjects like Science. Beyond traditional methods such as lecturing, storytelling, or demonstrations, students achieve better learning outcomes by performing practical tasks independently.

Moreover, knowledge gained through hands-on experience remains in the memory for a longer duration. If knowledge acquired in subjects like Science, Social Science, and Psychology is applied through experiments in controlled environments, it inevitably leads to a positive change in student behavior. Thus, in this paper employs the experimental teaching method to evaluate educational achievement in Science. This topic has been selected to determine whether it strengthens the foundation of students' educational knowledge and to observe the level of precision and diligence with which they can perform in their subject.

Review of Related Literature:

1. Kadhiravan, S. (1999). The Effectiveness of CAI in Relation to the Use of Self-Regulated Learning Strategies by Students, Bharathiar University.
2. Rai. (2006). An Experimental Comparison of Two Learner-Centred Approaches of Teaching Science.
3. U.S. Sukla.(2006). A study of the impact of self-made original educational tools on students' academic achievement in mathematics education, Gujarat University.

Objectives of the Study:

1. To study the effect of experimental treatment on the Educational achievement of students.
2. To examine the impact of the experimental method on the Educational achievement of students.
3. To investigate the main effects and interaction effects of various variables under study.

Variables of the Study:

- Independent Variable:
- Gender (Boys, Girls)
- Group (control group, Experimental group)
- Type of school (Granted school, Non Granted school)
- Dependent Variable: Educational Achievement in Science

Hypotheses:

1. There will be no significant effect of group on the Educational achievement of students.
2. There will be no significant effect of gender on the Educational achievement of students.
3. There will be no significant effect of school type on the Educational achievement of students.
4. There will be no significant effect of the interaction of independent variables on the Educational achievement of students.

Type of Research:

The study follows a quantitative, quasi-experimental design. It is categorized as Experimental Research.

Population:

All Class-9 students from secondary schools in Kheda district were considered the population.

Sampling Method and Sample:

A purposive sampling method was used to select 84 students, equally divided into control and experimental groups.

Area of the Study:

Learning and Teaching through Educational Technology

Research Tool:

A researcher-developed Achievement Test in Science was used for data collection.

Procedure of Data collection:

On the first day of data collection, a pre-test was administered to the sample, and based on those scores, the participants were divided into two equivalent groups: an experimental group and a controlled group. Subsequently, teaching was conducted for both groups using two different instructional methods based on structured lesson plans. Finally, an achievement test was administered to measure their academic performance. Post-test scores were recorded and analysed.

Method of Data analysis:

T- value and F- ratio were used for data analysis.

Data Analysis and Interpretation:

Table -1

School	Group	Number	Average	S.D	SED	Diff.	t value
Granted	Exp.	21	19.24	16.79	1.26	3.20	2.55
	Cont.	21	16.10	16.10	1.26	3.20	2.55
Non Gr.	Exp.	21	19.86	4.53	1.011	2.91	2.87
	Cont.	21	16.95	10.65	1.011	2.91	2.87

1. The experimental group showed a positive impact on students' Educational achievement compared to the control group.
2. Gender parity was observed in the Educational achievement of students, with no significant difference between boys and girls.
3. No significant difference was found in the Educational achievement of students between granted and non-granted schools.

Major Finding:

1. The Educational achievement of the students in the experimental group was found to be superior to that of the students in the control group.
2. The Educational achievement of boys and girls was found to be equivalent.
3. A significant contribution of granted (aided) and non-granted (unaided) schools was observed in relation to students' Educational achievement.

Conclusion:

The study, titled 'Effectiveness of Experimental Teaching Method on educational Achievement in Science,' reveals a significant difference between the experimental and control groups, with the experimental group showing superior performance. This indicates that the experimental method has a positive impact, suggesting that more such innovative experiments should be conducted. Furthermore, no significant differences were observed based on the students' gender or the type of school.

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