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Effect Of Logical Analysis And Generalization Strategies To Enhancing Problem-Solving Ability In Calculus At Higher Secondary Level

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Abstract

In this paper, the reserarcher look at the potential for the valuable arrangement to help in this undertaking, and investigate its potential in two similar yet unique college course settings. This kind of incorporation builds understudies' numerical critical thinking abilities since writing in math expects understudies to exhibit. The educator makes an intentional arrangement between the arranged learning exercises and the learning results. This is a cognizant exertion to furnish the student with an unmistakably indicated objective, an all-around planned learning action or exercises that are fitting for the assignment, and very much planned appraisal standards for offering input to the student. Higher secondary students of Govt. Hr. Sec. School, Aravakurichi, Karur district only. There is a significant mean difference between pre and progressive assessment scores on Logical Analysis and Generalization Strategies among Higher Secondary School students. The mean scores of progressive tests (30.14) are greater than the pretest (25.21). The calculated 't' value of 19.59 is greater than the table value (2.41). Hence the hypothesis is rejected. it is concluded that there is a significant difference between pre and progressive test scores on Logical Analysis and Generalization Strategies among Higher Secondary School students.

Keywords: Logical Analysis and Generalization Strategies, Problem-Solving Ability, and Higher Secondary Level. etc.

Introduction

The proble solving is need proficient critical thinking abilities. To build the critical thinking abilities, their numerical thinking first should be created by encouraging their numerical reasoning. More elevated levels of intellectual reasoning are fundamental for propelling critical thinking abilities, which fills in as a vital component for understudies in science study halls today. Seto and Meel (2000) noticed that one of the essential changes in arithmetic instructing and learning is considered as coordinating composition into math homerooms. This kind of incorporation builds understudies' numerical critical thinking abilities

since writing in math expects understudies to exhibit how and why they know things, just as what they know (Banger-Drowns, Hurley, and Wilkinson, 2004). Notwithstanding, no examinations are zeroing in on composition as an arbiter for story critical thinking or story issue presenting. The motivation behind the current examination was to uncover the job of the creative cycle as a go-between of understudies' critical thinking abilities. Interest for and assumptions for college recreation schooling are rising, prodded by a few simultaneous patterns. These patterns remember the expanded utilization of reenactment for industry (Carson 2004) and its utilization in more financial areas (administration, transport (McGuire 1998), medical services (Hall et al. 2006), and others (e.g., development, shipbuilding) as well as assembling. Another pattern is expanding variety in understudy socioeconomics (age, inspiration, foundation, and destinations) – a pattern that time and again entices teachers into saying "The great understudies are improving, and the awful understudies are deteriorating." Yet another pattern of importance is expanded assumptions for understudies and their imminent businesses. Especially in the United States, understudies (and their folks!) as often as possible – as college costs continue to rise quickly – ask "What am I getting for this [tuition] cash?" As the new downturn and progressing, progressively serious cutthroat pressing factors bother businesses, those businesses are progressively prone to request prompt high efficiency, with almost no preparation or direction, of their fresh recruits (Preston 2012). Under the pressing factor of these rising assumptions, college reenactment schooling should keep on working on its adequacy. In this paper, we look at the potential for the valuable arrangement to help in this undertaking, and investigate its potential in two similar yet unique college course settings.

Logical Analysis and Generalization Strategies

Logical Analysis and Generalization Strategies are a guideline utilized for contriving to instruct and learning exercises, and appraisal assignments, that straightforwardly address the planned learning results (ILOs) in a way not normally accomplished in customary talks, instructional exercise classes, and examinations.[1] The constructive arrangement was concocted by Professor John B. Biggs and addresses a marriage between a constructivist comprehension of the idea of learning, and an adjusted plan for results-based instructing schooling. The productive arrangement is the supporting idea driving the current necessities for program detail, statements of learning results (Los) and evaluation models, and the utilization of rule-based appraisal. Two fundamental ideas are driving helpful arrangements. Students develop importance from how they deal with learning. This idea gets from psychological brain science and constructivist hypothesis and perceives the significance of connecting new material to ideas and encounters in the student's memory, and extrapolation to conceivable future situations through the deliberation of essential standards through reflection. The educator makes an intentional arrangement between the arranged learning exercises and the learning results. This is a cognizant exertion to furnish the student with an unmistakably indicated objective, an all-around planned learning action or exercises that are fitting for the assignment, and very much planned appraisal standards for offering input to the student. A part of the instructive assessment hypothesis has arisen that spotlight productive arrangement as a critical component in the compelling instructive plan. Known as configuration-centered evaluation,[2] this methodology looks for understudy input on the viability of the planned arrangement between the expected learning results and the instructing and learning exercises understudies participate in during a course of study.

problem-solving ability

Critical thinking is the heart of the investigation of math. The significance of training science and learning math to foster the capacities of tackling issues in math and to discover the arrangement of issues in day-by-day life. To numerous numerically proficient individuals, science is inseparable from taking care of issues, doing word issues, making designs, deciphering figures, creating mathematical development, demonstrating hypotheses, and so on the objective of instructing mathematic to be viable was that the understudies had the option to tackle its issues. That objective shows that learning arithmetic not just means to foster understudies in intellectual spaces, yet additionally intends to further develop the emotional area that can uphold critical thinking capacities. The consequences of the examination Joseph (2011) presumed that in future math appraisal ought not on the composed test investigation, but rather an investigation of expanding full of feeling understudies likewise should be finished. NCTM (1989) expressed that the demeanor of the understudies in looking at science and convictions can influence their accomplishment in math. The involvement with taking care of the issues of the subject is vital to foster understudies' reasoning abilities and help them acquire abilities in taking care of the issue in day-by-day life.

Need for the study

Critical thinking is considered as the core of arithmetic acquiring because the ability isn't just for mastering the subject, yet it stresses creating thinking expertise strategy too. Understudies can apply their insight and critical thinking abilities to be helpful in day-by-day life since the cycles of tackling the numerical issue are like the overall critical thinking. Fundamental schooling educational program, Buddhist period 2544 has indicated how mathematic learning and understudies' quality are significant; in any case, the understudies don't accomplish in learning the subject. The vast majority of the understudies' concern was numerical critical thinking, the main expertise for the understudies' further mastering. In this way, the advancement of critical thinking capacity in science is a significant mission that educators are going to worry about to foster such fundamental expertise for their understudies.

Objectives

The present study has the following objectives –

- To identify the level of problem-solving ability in calculus at the higher secondary level.
- To evolve a Logical Analysis and Generalization Strategies in enhancing problem-solving ability in calculus at the higher secondary level.

To implement the Logical Analysis and Generalization Strategies in enhancing problem-solving ability in calculus at a higher secondary level.

Hypotheses of the study

H_1: There is a significant mean difference between pre and progressive assessment scores on Logical Analysis and Generalization Strategies among Higher Secondary School students.

H_2: There is a significant mean difference between progressive and post-assessment scores on Logical Analysis and Generalization Strategies among Higher Secondary School students.

H_3: There is a significant mean difference between pre and post-assessment scores on Logical Analysis and Generalization Strategies among Higher Secondary School students.

Research Tool

The following tools will be developed and characterized by the investigator.

- Logical Analysis and Generalization Strategies
- Problem-solving ability scale.
- Achievement Test

Research Design

The experimental method will be adopted by the investigator in this research. A single group design will be adopted.

Selection of Sample

Population

The present investigation was conducted in Govt Higher Secondary School Aravakurichi, Karur District.

Sample

A Simple random sampling technique was used in this research. The investigator is working as a P.G. Assistant (Mathematics) teacher in Govt. Higher Secondary School, Aravakurichi, Karur district. He selected the sample from the same school for conducting experimentation of the study. All 24 students were taken as the sample which is considered an experimental group for the study. Among them, 7 boys and 17 girls are included in this study.

Scoring Method

Table 4.1
Scores of Logical Analysis and Generalization Strategies

S. No	Dimension	**No. of statements**	**Max score**	**Max marks**
1.	Logical Analysis	14	4	56
2.	Generalization	12	4	48
	Total	26	4	104

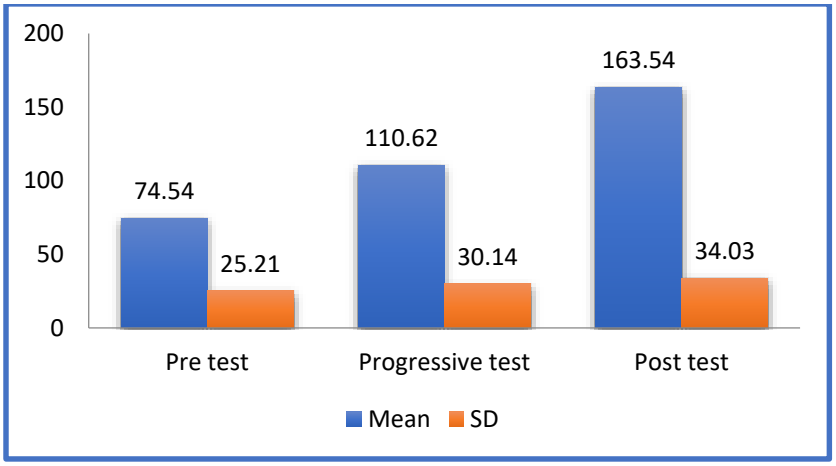
The above 4.1 table insist the 14 questions from Logical Analysis, 10 questions from Numeric & Symbolic Representation, 15 questions from Visualization, 10 questions from Formalization, and 12 questions from Generalization.

Table: 4.2
Mean and Standard Deviation scores on Logical Analysis and Generalization Strategies (Overall)
(Max Score: 244)

S. No.	**Test**	**Mean**	**SD**
1.	Pre test	74.54	25.21

2.	Progressive test	110.62	30.14
3.	Post-test	163.54	34.03

From the above table 4.2, it is observed that the mean scores on Logical Analysis and Generalization Strategies in posttest (163.54) progressive test (110.62), and pretest (74.54). The mean scores of Logical Analysis and Generalization Strategies in the posttest are greater than the mean scores of progressive test and Pretest. The increase in the mean scores shows the effect of Logical Analysis and Generalization Strategies to enhance problem-solving ability in calculus.



HYPOTHESIS TESTING

Hypothesis: 1 There is a significant difference between pre and progressive test scores on Logical Analysis and Generalization Strategies among Higher Secondary School students.

Table: 4.3

Difference between pre and progressive test scores on Logical Analysis and Generalization Strategies among Higher Secondary School students

S. No.	Logical Analysis and Generalization Strategies	Mean	SD	't' test	level of significance
1.	Pre-Test	25.21	5.14	19.59	S
2.	Progressive Test	30.14	6.15		

Significant at 0.01 level

Table 4.3 shows that the mean scores of progressive tests (30.14) are greater than the pretest (25.21). The calculated 't' value of 19.59 is greater than the table value (2.41). Hence the hypothesis is rejected. it is concluded that there is a Significant difference between pre and progressive test scores on Logical Analysis and Generalization Strategies among Higher Secondary School students.

Hypothesis: 2 There is a significant difference between progressive test and post-test scores on

Logical Analysis and Generalization Strategies among Higher Secondary School students.

Table: 4.4

Difference between progressive test and post-test scores on Logical Analysis and Generalization Strategies among Higher Secondary School students

Sl. No.	Logical Analysis and Generalization Strategies	Mean	SD	't' test	level of significance
1.	Progressive Test	30.14	6.15	25.59	S
2.	Post-test	34.03	6.94		

Significant at 0.01 level

Table 4.4 shows that the mean scores of posttests (34.03) are greater than the progressive test (30.14). The calculated 't' value 25.59is greater than the table value (2.41). Hence the hypothesis is rejected. It is concluded that there is a significant difference between progressive test and post-test scores on Logical Analysis and Generalization Strategies among Higher Secondary School students.

Hypothesis: 3 There is a significant difference between pre and post-test scores on Logical Analysis and Generalization Strategies among Higher Secondary School students.

Table: 4.5

Difference between pre and post-test scores on Logical Analysis and Generalization Strategies among Higher Secondary School students

S. No.	Constructive alignment Strategies	Mean	SD	't' test	level of significance
1.	Pre test	25.21	5.14	24.97	S
2.	Post-test	34.03	6.94		

Significant at 0.01 level

Table 4.5 shows that the mean scores of posttests (25.21) are greater than the pretest (34.03). The calculated 't' value of 24.97 is greater than the table value (2.41). Hence the hypothesis is rejected. It is concluded that there is a Significant difference between pre and post-test scores on Logical Analysis and Generalization Strategies among Higher Secondary School students.

Results and findings

From the above table 4.2, it is observed that the mean scores on Logical Analysis and Generalization Strategies in posttest (163.54) progressive test (110.62), and pretest (74.54). The mean scores of Logical Analysis and Generalization Strategies in the posttest are greater than the mean scores of progressive test and Pretest. The increase in the mean scores shows the effect of Logical Analysis and Generalization Strategies to enhance problem-solving ability in calculus.

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Conclusion

Research showed that integrating Logical Analysis and Generalization Strategies in Enhancing Problem-Solving Ability in Calculus at Higher Secondary Level. The mathematics classroom can substantially increase students' mathematics cognition, and the present study specifically noted that the writing process helped develop students' problem-solving skills.

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