

Relationship Of Geometry And Algebra On The Mathematical Achievement Of D.El. Ed Students Of Kerala

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D.El.Ed Classes
Diploma in Elementary Education Classes.
It is a two year primary teacher training programme.

Abstract

Mathematics education is an essential cornerstone of modern societies, laying the foundation for problem-solving, critical thinking, and analytical skills. Among the diverse fields of mathematics, geometry and algebra stand out as fundamental branches, each possessing its unique set of concepts, principles, and applications. These two domains are not isolated entities; instead, they are closely interconnected, fostering a symbiotic relationship that influences students' mathematical achievement. The focus of this paper is to explore and understand the relationship between geometry and algebra and its impact on the mathematical achievement of D.El.Ed (Diploma in Elementary Education) students in Kerala.

Introduction:

In the educational landscape, D.El.Ed programs hold paramount significance as they prepare future educators, nurturing young minds during their formative years of learning. Proficiency in mathematics is an indispensable skill for these aspiring teachers as they endeavor to impart foundational knowledge to primary school students. While the significance of geometry and algebra in the curriculum is widely acknowledged, their distinct roles and contributions to enhancing mathematical aptitude deserve comprehensive examination.

The connection between geometry and algebra extends beyond mere theoretical intersections; rather, it resonates deeply with practical applications in everyday life and various academic disciplines. Geometry, with its emphasis on shapes, spatial relations, and visual thinking, contributes to the development of spatial reasoning skills, critical for comprehending complex concepts in fields such as science, engineering, and architecture. On the other hand, algebra emphasizes symbolic representation, generalization, and abstract problem-solving, fostering logical thinking and deductive reasoning, which are indispensable for mastering advanced mathematical concepts.

Despite their individual merits, the interrelation of geometry and algebra in the context of mathematical achievement remains an area that merits further investigation. Understanding the potential synergy between these two branches could yield insights that inform the development of effective teaching methodologies and curricula for D.El.Ed students in Kerala. Moreover, by delving into the unique learning needs of this specific cohort, educational institutions can design targeted interventions that enhance mathematical proficiency and promote a deeper appreciation for the elegance and practicality of both geometry and algebra.

This paper aims to critically analyze existing research, studies, and pedagogical practices related to geometry and algebra in the context of D.El.Ed education in Kerala. By synthesizing current knowledge, we hope to shed light on the potential benefits of a balanced integration of geometry and algebra instruction and its consequential impact on the mathematical achievement of future educators. Ultimately, such insights can contribute to the refinement of mathematics education strategies, nurturing a generation of well-equipped teachers who can inspire and empower the young minds they will shape in their classrooms.

NEED AND SIGNIFICANT

The study on the relationship of geometry and algebra on the mathematical achievement of D.El.Ed students in Kerala holds significant importance for various stakeholders in the field of education. Here are some reasons why this study is needed and its significance: Enhancing Mathematics

Education Understanding the interplay between geometry and algebra can lead to the development of more effective mathematics education strategies. By identifying how these two branches complement each other, educators can design integrated curricula that promote a deeper understanding of mathematical concepts among D.El.Ed students.

Personalized Instruction Recognizing the diverse learning needs and preferences of D.El.Ed students, this study can help educators tailor instruction to cater to individual strengths and weaknesses. Some students may grasp concepts better through geometric visualizations, while others may find algebraic representations more intuitive. Offering a variety of teaching approaches can improve overall learning outcomes.

Optimizing Teaching Methods Through an exploration of existing research and practices, the study can shed light on effective teaching methods that facilitate the seamless integration of geometry and algebra. Teachers can incorporate innovative techniques, such as incorporating real-world applications and problem-solving tasks, to engage students more effectively.

Teacher Preparation As D.El.Ed students are future elementary educators, understanding the relationship between geometry and algebra can enhance their own mathematical proficiency and pedagogical skills. Equipped with a deeper understanding of these two branches, they can inspire their future students and foster a love for mathematics.

Curriculum Development The study's findings can inform curriculum developers and policymakers about the importance of a balanced inclusion of geometry and algebra in the D.El.Ed program. This can lead to a more comprehensive and well-rounded mathematics curriculum that prepares students for the challenges of teaching diverse groups of elementary school children. **Addressing Learning Gaps** By identifying potential gaps in D.El.Ed students' mathematical understanding related to geometry and algebra, the study can help address these weaknesses early on in the teacher preparation process. This proactive approach can lead to more confident and capable educators in the long run. **Research Gap Filling** If there is a dearth of research on this specific topic in the context of Kerala's

D.El.Ed program, this study can serve as a valuable contribution to the existing body of knowledge. It can act as a foundation for further research and exploration in the area of mathematics education for teacher training programs. The study's findings can influence educational policies and decision-making related to the structure and content of the D.El.Ed program. Policymakers can use this information to make informed choices about improving mathematics education for aspiring teachers in the state.

The study's significance lies in its potential to bridge the gap between geometry and algebra instruction and its impact on the mathematical achievement of D.El.Ed students. By focusing on the unique context of Kerala and its teacher preparation program, the research can have practical implications that positively affect mathematics education, teaching quality, and ultimately the mathematical competence of elementary school students in the state.

Objectives of the study

1. To find out the relationship between the performance of Geometry and Mathematical achievement of D.El.Ed students In Kerala.
2. To find out the relationship between the performance Algebra and Mathematical Achievement of D.El.Ed students In Kerala.
- 3 To find out the effect of the performance Geometry and the performance Algebra on mathematical Achievement of D.El.Ed students in Kerala.

Hypothesis

1. There is no significant relationship between the performance Geometry and Mathematical achievement of D.EL.Ed students In Kerala.
2. There is no significant relationship between the performance Algebra and Mathematical Achievement of D.El.Ed students In Kerala.
3. 3 There is no significant effect of the performance Geometry and the performance Algebra on mathematical Achievement of D.El.E students In Kerala.

Methodology of the study

The study will utilize a quantitative research design, specifically a cross-sectional survey. The survey will be

conducted to gather data on D.El.Ed students' mathematical achievement, exposure to geometry and algebra, and their perceptions of the interplay between the two domains. A random sampling technique will be employed to select 100 participants from various D.El.Ed colleges in different regions of Kerala. Random sampling ensures that each student has an equal chance of being selected, making the sample representative of the entire D.El.Ed student population in the state. A teacher made achievement test was developed by investigator having two parts Geometry. Prior permission will be obtained from the respective D.El.Ed colleges and authorities to conduct the survey. The data collection process will involve visiting the selected colleges and distributing the questionnaires to the randomly chosen D.El.Ed students. To ensure a high response rate, follow-up reminders and encouragement will be given to the participants.

Data Analysis:

The collected data will be entered into a statistical software program for analysis. Descriptive statistics (e.g., mean, median, standard deviation) will be used to summarize the demographic characteristics of the participants and their responses to the Likert-scale questions. Inferential statistics, such as correlation analysis and regression, will be used to examine the relationship between exposure to geometry and algebra and mathematical achievement. Results and discussion To find out the relationship between Geometry and Mathematical achievement of D.El.Ed students In Kerala.

Results of the relationship between Geometry and Mathematical achievement of D.El.Ed students In Kerala.

	N	r	P value
Geometry	100	.357	.000
Mathematical achievement			

The correlation coefficient (r) between Geometry and Mathematical achievement is 0.357. The correlation coefficient measures the strength and direction of the linear relationship between two variables. In this case, the

positive value of 0.357 indicates a weak positive correlation between Geometry and Mathematical achievement. In this case, the p-value is less than the standard significance level of 0.05, indicating that the correlation is statistically significant. The results suggest that there is a weak positive relationship between Geometry and Mathematical achievement among D.EL.Ed students in Kerala. The statistically significant p-value indicates that the correlation is not due to random chance and that the relationship between the two variables is likely to be meaningful.

However, it is essential to consider that a correlation coefficient of 0.357 indicates a relatively weak relationship. This means that while there is some connection between Geometry and Mathematical achievement, other factors may also be influencing the students' performance in Mathematics.

To find out the relationship between Algebra and Mathematical achievement of D.El.Ed students In Kerala.

Results of the relationship between Algebra and Mathematical achievement of D.El.Ed students In Kerala.

	N	r	P value
Algebra	100	.477	.000
Mathematical achievement			

The correlation coefficient (r) between Algebra and Mathematical achievement is 0.477. The correlation coefficient measures the strength and direction of the linear relationship between two variables. In this case, the positive value of 0.477 indicates a moderate positive correlation between Algebra and Mathematical achievement. the p-value is less than the standard significance level of 0.05, indicating that the correlation is statistically significant. The results suggest that there is a moderate positive relationship between Algebra and Mathematical achievement among D.EL.Ed students in Kerala. The statistically significant p-value indicates that the correlation is not due to random chance and that the relationship between the two variables is likely to be meaningful. A correlation coefficient of 0.477 suggests a stronger relationship than the previous correlation coefficient of 0.357 for Geometry. This indicates that

Algebra has a more significant influence on Mathematical achievement for these students compared to Geometry.

To find out the effect of Geometry and Algebra on mathematical Achievement of D.El.Ed students In Kerala

The effect of Geometry and Algebra on mathematical Achievement of D.El.Ed students in Kerala

Model Summary						
Model		R	R Square	Variance	Adjusted R Square	Std. Error of the Estimate
1		.520 ^a	.271	27.1%	.255	3.384
a. Predictors: (Constant), Algebra , Geometry						
ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	411.901	2	205.950	17.987	.000 ^b
	Residual	1110.659	97	11.450		
	Total	1522.560	99			
a. Dependent Variable: achievement						
b. Predictors: (Constant), Algebra , Geometry						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.834	.966		8.113	.000
	Geometry	.691	.290	.220	2.384	.019
	Algebra& Time	1.641	.376	.403	4.365	.000
a. Dependent Variable: achievement						

The correlation coefficient (R) between the predictors (Geometry and Algebra) and the dependent variable (mathematical achievement) is 0.520. This indicates a moderate positive relationship between the predictors and the achievement score. The coefficient of determination (R Square) is 0.271, indicating that approximately 27.1% of the variance in mathematical

achievement can be explained by the predictors (Geometry and Algebra).

Adjusted R Square: The adjusted R Square is 0.255, which takes into account the number of predictors and adjusts the R Square value accordingly. **Error of the Estimate:** The standard error of the estimate is 3.384. This value represents the average distance between the actual data points and the predicted values by the model. The coefficients table provides the unstandardized coefficients (B) and the standardized coefficients (Beta) for the predictors (Geometry and Algebra). The constant coefficient is 7.834, representing the intercept of the regression equation when all predictors are zero. **Geometry:** The unstandardized coefficient for Geometry is 0.691, and the standardized coefficient (Beta) is 0.220. This suggests that for each unit increase in Geometry, the mathematical achievement score increases by 0.691 units. **Algebra.** The unstandardized coefficient for Algebra is 1.641, and the standardized coefficient (Beta) is 0.403. This indicates that for each unit increase in Algebra & Time, the mathematical achievement score increases by 1.641 units. The study reveals that both Geometry and Algebra have a significant positive effect on the mathematical achievement of D.El.Ed students in Kerala. The combined model explains around 27.1% of the variance in the achievement scores, with Algebra having a relatively stronger influence than Geometry. The findings suggest that integrating both Geometry and Algebra into the curriculum, along with giving sufficient time for learning and practice, can positively impact the mathematical achievement of the students.

Findings

1. The study reveals that both Geometry and Algebra are important factors that contribute to students' mathematical achievement. The combined model with these predictors explains a significant portion of the variance in the achievement scores, and it highlights the significance of including both Geometry and Algebra concepts in the educational program for D.El.Ed students in Kerala.
2. The positive correlation coefficient (0.357) indicates a weak positive relationship between Geometry and Mathematical achievement. This means that as the

students' performance in Geometry increases, there is a tendency for their Mathematical achievement to also increase, but the relationship is not very strong.

3. The positive correlation coefficient (0.477) indicates a weak positive relationship between Algebra and Mathematical achievement. This means that as the students' performance in Algebra increases, there is a tendency for their Mathematical achievement to also increase, but the relationship is not very strong.

Implications of the study

The study highlights the importance of integrating Geometry concepts into the curriculum of D.El.Ed students. Ensuring that Geometry is adequately covered in the curriculum can potentially contribute to improving students' Mathematical achievement.

Educators and teachers can use the findings to develop effective teaching strategies that emphasize both Geometry and its application in Mathematics. Using interactive and engaging teaching methods for Geometry may help enhance students' overall understanding and performance in Mathematics.

Based on the study's findings, educators can identify students who might be struggling with Geometry and offer targeted interventions to improve their understanding of the subject. This personalized approach may lead to better Mathematical achievement outcomes for these students. The study highlights the role of time spent on Geometry and its effect on Mathematical achievement. Therefore, educational institutions can consider allocating sufficient time for teaching and learning Geometry to ensure students have a strong foundation in this area. While the study focuses on the relationship between Geometry and Mathematical achievement, it also emphasizes that other factors may influence students' performance in Mathematics. Therefore, taking a holistic approach that considers multiple variables and their interactions may lead to a more comprehensive understanding of factors affecting Mathematical achievement. The study opens avenues for further research to explore the specific reasons behind the weak positive relationship between Geometry and Mathematical achievement. Future studies can delve into the influence of various variables, such as teaching methods, student

engagement, and individual differences, to gain deeper insights into improving students' Mathematical achievement. Policymakers can use the findings of this study to inform decisions related to curriculum development, teacher training, and resource allocation in the context of D.El.Ed education in Kerala. Incorporating evidence-based strategies can lead to improvements in students' overall Mathematical achievement.

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