Exploring the Development of Creative Imagination across Different School Grades

Dr. Bijal Zaveri[1], Paramjit Baxi[2], Dr. Praveen Kumar Thakur[3], Ameya Ambulkar[4], Raman Verma[5], Raghu N[6], Diksha Aggarwal[7]

[1]Dean & Director, Parul Institute of Management and Research-MBA, Parul University, India, bijal.zaveri@paruluniversity.ac.in

[2]Chitkara Centre for Research and Development, Chitkara University, Himachal Pradesh, India, paramjit.baxi.orp@chitkara.edu.in

[3]Professor, Department of Law, ARKA JAIN University, India, dr.praveen@arkajainuniversity.ac.in

[4]Faculty, Department of ISME, ATLAS SkillTech University, India, ameya.ambulkar@atlasuniversity.edu.in

[5]Centre of Research Impact and Outcome, Chitkara University, Rajpura, Punjab, India, raman.verma.orp@chitkara.edu.in

[6]Associate Professor, Department of Electrical and Electronics Engineering, Faculty of Engineering and Technology, JAIN (Deemed-to-be University), India, n.raghu@jainuniversity.ac.in

[7]Quantum University Research Center, Quantum University, India. diksha.aggarwal@quantumeducation.in

Abstracts

The development of creative imagination across different school grades involves examining that students' ability to think creatively and imaginatively evolves as they progress through their education journey. This study examines the development of imaginative creativity across a range of students' grades, emphasizing the roles that various factors play in students' creative growth, such as parental engagement, creative competition participation, innovative problem-solving skills, guidance from teachers, and visualization abilities. Information has been gathered from 150 teachers and 150 students who took part in speech, storytelling, and art competitions. With the use of SPSS version 28, discriminant and factor analyses were carried out to examine how these variables differentiate students across grade levels and identify fundamental aspects of creativity. Also, the self-reported questionnaires were executed to explore the student's creative thinking level. The outcomes show that creative problem-solving skills and mentorship from trainers are important factors in enhancing students' creativity, parental involvement and visualization also have a significant impact. These results highlight the importance of parental and instructional guidance in supporting inventive growth throughout various school grades and provide insightful information about the elements

influencing students' increased creativity.

Keywords: imaginative, creative thinking, discriminant analysis, teacher support, problem-solving skills.

Introduction

General skills like creative thinking, imagination, and innovation must be developed in school, and the ability to blend creativity with knowledge. Given that many students can enhance their creativity, it should reevaluate the conventional methods for encouraging it in the classroom and provide more viable alternatives [1]. Since creativity and imaginative thinking are the mental processes that creators employ to create their works of creativity as a safe medium for self-expression, self-awareness, self-control, and self-realization, creative learning needs to adopt these same processes and be customized for each student [2]. Inspiring beliefs and attitudes, motivation and taking chances, determination, practical and exploratory strategy, attention to emotions and an individual's belonging, and recognizing via themes are some of the recommended methods of instruction that might encourage creativity. Creative inquiry should be the foundation of teacher preparation programs, and educational tasks should incorporate methods that encourage innovation so that educators may approach teaching [3]. Thinking creatively is a twenty-first-century talent that describes a person's capacity to look for answers, and hazard predictions, develop ideas, and then revise and evaluate them for successfully conveying the outcomes to others [4]. Throughout their education, students should engage with an educational program that equips them with the skills to address challenges in the future. This will help them build their talent for thinking creatively [5]. The mentally demanding process of creativity produces original and worthwhile concepts, responses, and outputs. It is necessary for many aspects of human existence, including schooling and academic achievement. In both research and teaching, the idea that creativity may improve student performance has grown more and more prevalent [6]. According to cognitive investigations into the brain mechanisms behind imaginative thinking, the brain's afferent cingulate cerebellum, default setting network, and prefrontal cortex are among the brain areas associated with creative thought [7]. Different cognitive processes, including ideation, flexibility in thinking, and solving issues, are linked with these areas. According to the setting and the precise metrics of academic success and creativity used in the research, the link between these two concepts is complicated and subject to change [8]. Students who can think creatively can approach challenges in new ways and come up with unique solutions. This may be particularly beneficial in fields like mathematics and physics, where solving complicated challenges is required [9]. Memory and knowledge retention can be enhanced through creative activity. Students may understand and remember the material better when they actively participate in creative assignments linked to the subject. Students' interest and engagement levels might rise when creative components are incorporated into the teaching procedure. When students are allowed to experiment and communicate their ideas creatively, they become more engaged in their academics [10]. The following Fig1 shows how the students visualize their creative thinking with the help of their teachers and parents.

Fig 1 Student's creative thinking with the help of teachers and parents

I. Aim and Key Contribution

This study's goal is to explore how student's creativity and imagination varies from different school grades.

The data was collected from 150 students and 150 teachers, using their grades, age, and involvement in participation in art, storytelling, and speech competitions.

This study used self-reported questionnaires to explore the student's creative thinking levels with the help of educators and parents.

The data was statistically examined using the analysis of discriminative and factor with SPSS version 28.

Literature review

To offer a tool to evaluate how well schools foster students' inventiveness, imagination, and creativity, it involved 268 teachers with an ensemble of 5020 students [11]. According to the findings, pupils indicated greater chances for creativity than for imagination or innovation. Nevertheless, students responded less than teachers' expectations. Future directions in study and practice were explored.

The development of technology-enhanced instruction and evaluation that encourage imaginative thinking competencies has provided an environment for preliminary evaluations of creative

thought frameworks [12]. To help stimulate imaginative thinking and evaluate the development of competencies, task models were provided. It was additionally investigated where learning and evaluation methodologies might go in the future.

The artistic intents of students who drew in both mainstream and Steiner schools. 57 kids between the ages of 6 and 16 were invited to finish informal interviews and one artwork. The immediate environment, memories, representation content with creativity, and the desire to convey a feeling or statement were found to be the four primary concepts. The frequency of imaginative or real-world sources did not change between the groups, but Steiner students paid more attention to expressive concepts [13].

Educational achievement and imaginative thinking were found to be positively correlated in an investigation that involved 2,355 Chinese high school pupils [14]. It was discovered that creative thinking was less effective than convergent thought. Performance in school was impacted by innovative thinking through internal locus of authority and self-worth. According to the study, school administrators had to concentrate on encouraging creative thinking among underprivileged pupils.

Researchers who specialize in creativity have long examined the connection between learning and creativity, and the majority of their findings point to a beneficial one. Fewer research, meanwhile, have made use of a more customized evaluation. It presented a novel method based on cross-sequential research with 2,372 individuals employing the Creativity and Learning in School Achievement Test (CLISAT). Examining complex connections between educational achievement and innovation in math and language with the CLISAT has monetary consequences for theory building and future research [15].

The latest industrial revolution has led to an increased focus on STEM subjects and the value of imagination in the workforce of the twenty-first century [16]. A considerable loss in mathematical imagination within years was identified in Australian school research, with causes connected to the surroundings, the individual, and the procedure. The study analyzed the link between possible barriers and the growth of mathematical imagination in middle school pupils.

The children's and teenagers' creative collaboration from elementary school to adolescence. It aimed to evaluate any development disparities and comprehend its course [17]. It was discovered that social viewpoint coordination modulated the positive association between age and creativity and was a favorable indicator of group imagination. A modest negative correlation was found between subjective task enthusiasm. The results imply that as a group develops, creativity increases.

The aim of the study [18] was to investigate the way a collaborative educational program affected the innovative thinking of fifth-grade children and how that thinking related to their academic achievement. There was a moderately favorable link between academic success and creative thinking, and the experimental group demonstrated a considerable increase in creativity ratings when compared with the control group. According to the research, school-age children's capacity for creative thought could be improved through shared learning.

Participants

The data was gathered from 150 teachers and 150 students to evaluate the impact of creative competitions in art, storytelling, and speech on the development of creative imagination. Teachers will be asked to provide their observations on how these competitions influence students' imaginative skills, while students will report on their experiences and perceptions of participating in these activities are shown in Table I. This evaluation will be conducted through a structured questionnaire administered to both groups, aiming to assess the relationship between engagement in these creative competitions and the enhancement of imaginative abilities.

Table I Data about participants

Demographic variable	Category	Students (n=150)	Teachers (n=150)
Grade level (students)	Less than 5	50	-
	5 to 10	50	-
	Above 10	50	-
Type of school	Public	75	65
	Private	75	85
Gender	Male	58	60
	Female	92	90
Performance in Art competitions	High performance	40	-
	Medium performance	60	-
	Low performance	50	-
Performance in storytelling competitions	High performance	45	-
	Medium performance	55	-
	Low performance	50	-
Performance in speech competition	High performance	50	-
	Medium performance	50	-
	Low performance	50	-
Age (Teachers)	25-30	-	30
	31-40	-	60
	41-50	-	40
	51+	-	20
Years of Experience (Teachers)	1-5 years	-	50
	6-10 years	-	60
	11-15 years	-	30
	16+ years	-	10
Educational Qualification (Teachers)	Bachelor's Degree	-	70
	Master's Degree	-	60
	Doctorate Degree	-	20

Variables

Teachers' Support for Imagination: This independent variable measures how much instructors facilitate and encourage inventive questioning through activities and sources. It influences students' innovative improvement and might slight the outcomes of other variables on creativity.

Imaginative Problem-Solving Skills: This dependent variable reflects students' ability to clear up issues creatively and observe inventive strategies. It is laid low with elements along with teacher help, engagement in innovative sports, and parental encouragement.

Engagement in Creative Activities: This dependent variable verifies the level of participation in activities that simulate creativity. It is encouraged by trainer assistance, parental engagement, and students' personal abilities and might impact their creative problem-solving competencies.

Visualization Skills: This dependent variable evaluates students' potential to create and manage intellectual images. It is formed with the aid of engagement in innovative activities and teacher support, and it impacts how students use creativeness in problem-solving and getting to know.

Parental Engagement of Creativity: This mediating variable measures the extent to which mother and father support and encourage creative activities at home. It develops students' engagement in innovative activities and can moderate the impact of the trainer's guidance on inventive trouble-solving talents.

Research instruments

The self-reported questionnaire is designed to evaluate the effect of artistic contests on the growth of creative abilities among 150 students and 150 teachers. For the art competitions, which lasts 1 hour, questions focus on teacher support for imagination, student's problem-solving skills, along with the engagement in creative activities, visualization abilities, and parental involvement. Similarly, for the 30-minute storytelling and speech competitions, the questionnaire assesses student's creativity and imaginative thinking to understand how short-duration creative activities influence imaginative development. Teachers will provide insights into how these competitions affect students' creativity, while students will share their experiences and perceptions. This structured approach aims to capture a comprehensive view of the relationship between participation in these completions and the enhancement of creative abilities.

Data analysis

For the study, discriminant and factor analyses could be completed using the SPSS latest version 28. Discriminative analysis might be used to discover underlying dimensions of creativity via analyzing how variables of teacher support, inventive problem-solving skills, and engagement in innovative activities, visualization capabilities, and parental engagement cluster collectively. The discriminant analysis will then observe these dimensions to distinguish between students across one of a kind grade levels, evaluating that efficaciously these factors classify students into awesome grade categories. This method will yield insights into the interrelationships amongst creativity variables and their influence on scholar's developmental stages.

I. Discriminant analysis

Objective of Discriminant Analysis: In the study exploring the improvement of innovative creativeness across exceptional grades, discriminant analysis identifies which variables instructors guide for creativeness, imaginative problem-solving abilities, engagement in creative sports, visualization skills, and parental engagement of creativity best differentiate students

throughout grade ranges. This allows monitoring how creativity develops as a college student's development through their education.

Key variables: Grades 1-5 might also rely greater on teacher support and parental engagement to nurture creativity. In assessment, grades 6-10 and above 10 are predicted to expose better ranges of imaginative problem-solving, engagement in creative sports, and visualization skills, reflecting greater independence and cognitive maturity.

Educational Implications: The evaluation offers insights for educators, suggesting that more students benefit greater from outside assistance, even as older students must be recommended to have interaction in unbiased creative duties. This knowledge allows targeted coaching techniques that beautify creativity at exclusive academic levels.

II. Factor Analysis

Purpose of Factor Analysis: Factor analysis will be used to find the core dimensions that explain how diverse components of innovative creativeness are interrelated. This analysis will have a look at how variables include trainer assist for imagination, inventive trouble-fixing abilities, engagement in creative sports, visualization competencies, and parental engagement in creativity. By uncovering these underlying factors, the evaluation will reveal how special components of creativity are interrelated and contribute to scholar's innovative development throughout diverse grade stages.

Factor Identification: Teacher support for imagination and parental engagement of creativity may additionally load onto an aspect reflecting external support and encouragement, highlighting the importance of external influences on grade one to five creativity.

Imaginative problem-solving skills, engagement in creative activities, and visualization skills may load onto a component associated with creative competence and autonomy, indicating how these abilities and behaviors are interrelated as students enhance their training.

Factor analysis will reveal that those elements integrate to persuade innovative imagination and the way they differ across grade ranges. This understanding facilitates in identifying key areas for targeted educational interventions.

Educational Implications: By identifying these underlying factors, educators can better recognize how various elements of creativity interrelate. For grade 1-5 students, emphasizing outside help and encouragement can be critical, whilst for grade 5-10 students, fostering skills related to creative competence and autonomy need to be a priority. This tailored approach enables creativity improvement techniques at special instructional stages.

Evaluation Criteria

This section shows the student's creativity and imagination thinking level utilizing the discriminant and factor analysis.

I. Discriminative analysis

Table II the outcome of discriminative analysis

Variable	F 1	F2	Eigen value	% of Variance	Cumulative %	Canonical Correlation	Wilks' Lambda	Chi-Square	df	Sig
Teacher Support for Imagination	0.672	0.152	0.785	72.5	72.5	0.851	0.397	135.458	10	0.000
Imaginative Problem-Solving Skills	0.458	0.434	0.785	72.5	72.5	0.851	0.397	135.458	10	0.000
Engagement in Creative Activities	0.537	-0.154	0.235	22.1	94.6	0.586	0.817	37.899	6	0.000
Visualization Skills	0.385	0.564	0.235	22.1	94.6	0.586	0.817	37.899	6	0.000
Parental Engagement of Creativity	0.454	-0.345	0.785	72.5	72.5	0.851	0.397	135.458	10	0.000

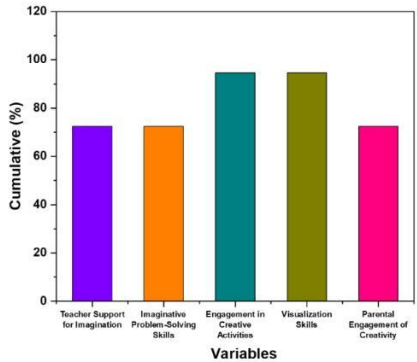

Fig 2 Graphical representation of discriminative analysis

The above Table II and Fig 2 summarize the results of a discriminant function analysis for exploring creative imagination development across different school grades. The high eigenvalue (0.785) and variance explained by teacher support for imagination (72.5%) indicate that it is a strong predictor of creative development. Imaginative problem-solving skills and parental engagement in creativity also contribute significantly, sharing similar values in eigenvalue and variance explained. Engagement in creative activities and visualization skills have lower eigenvalues (0.235) and explain less variance (22.1%), suggesting they play a more moderate role. The canonical correlation values reflect a strong relationship between the discriminant

functions and the grade-level classification. The chi-square test is significant, confirming the model's effectiveness in distinguishing between different grades.

II. Result of Factor analysis

Table III. The outcome of factor analysis

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Eigen value	% of Variance	Cumulative %
Teacher Support for Imagination	0.735	0.200	0.150	0.080	0.100	3.500	35.0	35.0
Imaginative Problem-Solving Skills	0.680	0.210	0.120	0.100	0.050	2.800	28.0	63.0
Engagement in Creative Activities	0.620	0.300	0.250	0.100	0.150	1.900	19.0	82.0
Visualization Skills	0.500	0.600	0.300	0.150	0.200	1.200	12.0	94.0
Parental Engagement of Creativity	0.550	0.400	0.350	0.300	0.150	1.000	10.0	100.0

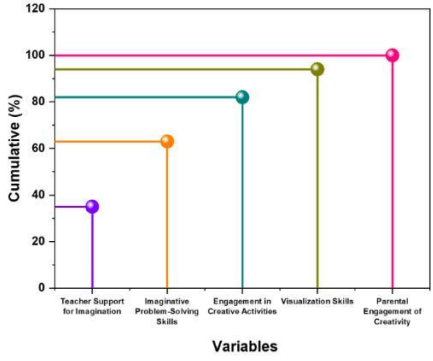

Fig 3 Graphical representation of factor analysis

The factor analysis results in Table III and Fig 3 reveal the underlying dimensions of creativity as measured by the variables. Teacher support for imagination and imaginative problem-solving skills loads heavily on factor 2, indicating this factor's strong association with supportive and problem-solving aspects of creativity. Engagement in creative activities contributes significantly to factor 2, which captures the active participation in creative processes. Visualization skills and parental engagement of creativity have notable loading on factors 3 and 4, reflecting their roles in mental imagery and external encouragement, respectively. The eigenvalues and percentage of variance show that factors 1 and 2 account for the majority of the variance, while additional

factors contribute to the comprehensive understanding of creative development, explaining the variance. This distribution highlights the multifaceted nature of creativity, encompassing various dimensions influenced by both internal and external factors.

Discussion

The study highlights the significant impact of teacher support, parental engagement, and creative competition on students' imaginative creativity across different grade levels. The results from the discriminant and factor analyses reveal that creative problem-solving skills and guidance from teachers are particularly influential in fostering students' creativity. Parental involvement and visualization skills also play key roles, suggesting a comprehensive approach to nurturing creativity both at home and in school. These findings highlight inventive thinking, additionally, the study provides insights into how creativity evolves across grades, offering direction for future educational strategies.

Conclusion

The evaluation of innovative thinking across various grade levels, examining the influence of factors such as parental involvement, participation in creative competitions, problem-solving skills, teacher guidance, and visualization abilities. Data were collected from 150 teachers and 150 students who participated in art, storytelling, and speaking events. Factor and discriminant analyses using SPSS version 28 reveal significant insights into the contribution of these factors to students' creative growth. The results highlighted the critical role of both parental support and instructional guidance in fostering imaginative development at different educational stages. Additionally, the study demonstrates the effectiveness of short-duration creative activities in stimulating creativity and provides a framework for designing impactful interventions. This comprehensive analysis offered actionable strategies for enhancing creativity in educational setting and underscores the importance of a collaborative approach involving both parents and teachers.

Limitations and future scopes

a) Limitation: This study's limited sample size and reliance on self-reported data reduce its generalizability. It also focuses on only a few creative domains and lacks a longitudinal perspective, restricting insights into how creativity develops over time.

b) Future Scope: Future research should include larger, more diverse samples and explore additional creative fields like music and digital arts. Longitudinal studies and qualitative methods could offer a deeper, more comprehensive understanding of creative imagination development.

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