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Research Paper

Impact of Rural, Urban Areas and Cognitive Flexibility on Divergent Thinking of Undergraduate Students

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ABSTRACT

Impact of Cognitive Flexibility on Divergent Thinking of Undergraduate Students was examined in the present research. A random sample comprised of 120 Undergraduate Students selected from the colleges of Agra, Firozabad, and Mathura. The age range of the Students was between 18 to 25 years. Cognitive Flexibility Scale by Martin and Rubin (1995) and Items from the Alternative Uses Task designed by Guilford (1967) measuring the divergent thinking is used. Results indicate a significant impact of Cognitive Flexibility (F value =7.15) on Divergent Thinking of Undergraduate Students. The F value =14.87 for Rural and Urban areas on Divergent Thinking of Undergraduate Students which means there is significant impact of areas on Divergent Thinking.

Keywords: *Cognitive Flexibility, Divergent Thinking, Area and Undergraduates Students*

The concept of cognitive flexibility plays a critical role in how individuals adapt to changing environments and challenges, both in their academic and personal lives. Cognitive flexibility, defined as the ability to shift thinking strategies to approach problems from different angles, is essential for problem-solving in dynamic settings. This adaptability is not merely about altering responses but involves a comprehensive adjustment in behavior to align with new and unexpected circumstances, reflecting an ongoing interaction with an evolving environment.

Cognitive flexibility is a learned ability that can be developed through experience, making it a valuable skill in various domains of life. Payne et al. (1993) describe it as the adaptation of cognitive processing strategies—sequential operations that navigate through a problem space. This implies that cognitive flexibility is more than a reactive change; it is a proactive, strategic adjustment to ensure optimal goal achievement.

The relationship between cognitive flexibility and other psychological constructs, such as self-efficacy and positivity, further emphasizes its importance. Akyol and Boyaci (2020) found a significant positive correlation between cognitive flexibility, positivity, and career prospects, suggesting that students with higher cognitive flexibility and positivity are better

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equipped to navigate their future careers. Similarly, Esen, Ozcan, and Sezgin (2017) highlighted that various forms of self-efficacy (general, academic, social, emotional) are positively associated with cognitive flexibility, which in turn influences academic achievement.

Divergent thinking (DT), a creative process that involves generating multiple unique solutions to a problem, is closely tied to cognitive flexibility. DT is crucial for students, particularly undergraduates, who are transitioning into adult life where creative problem-solving is highly valued. Research by Nijstad et al. (2010) and Benedek et al. (2014) suggests that DT involves recombining unrelated concepts and avoiding conventional thinking patterns, both of which require a high degree of cognitive flexibility. Moreover, Runco (2015) and Morarua, Memmerta, and Kamp (2016) found that cognitive flexibility enhances DT, especially in contexts that demand broad attention and creativity.

In essence, cognitive flexibility is fundamental for effective divergent thinking, which in turn is vital for creativity and innovation. As undergraduate students face the demands of a rapidly changing world, their ability to think divergently—fueled by cognitive flexibility—becomes crucial for success, adaptation, and survival. This relationship underscores the importance of fostering cognitive flexibility as a core competency in educational settings to prepare students for future challenges.

METHODS

Objectives:

- To study the effect of Rural and Urban areas on Divergent Thinking of Undergraduate Students.
- To study the effect of Cognitive Flexibility on Divergent Thinking of Undergraduate Students.
- To study the significant interaction effect of Rural and Urban areas and Cognitive Flexibility on Divergent Thinking of Undergraduate Students.

Hypotheses:

- There would be significant effect of Rural and Urban areas on Divergent Thinking of Undergraduate Students.
- There would be significant effect of Cognitive Flexibility on Divergent Thinking of Undergraduate Students.
- There would be significant interaction effect of Rural and Urban areas and Cognitive Flexibility on Divergent Thinking of Undergraduate Students.

Variables:

- **Independent Variables:** (1) Cognitive Flexibility, (2) Rural and Urban areas.
- **Dependent Variable:** (1) Divergent Thinking.

Sample Description:

The sample comprised of 120 Undergraduate Students selected randomly from the colleges of Agra, Firozabad, and Mathura districts. The age range of the Students was between 18 to 25 years. Male and female students were included in the sample. They were registered with different academic programs. Those students having any psychological problem as declared by the medical practitioner are not considered in the sample.

Tools:

- **Cognitive Flexibility Scale (CFS):** developed by Martin and Rubin (1995) consists of 12 items and one dimension. The CFS is a 6-point Likert-type measuring tool, in which 1 stands for "strongly disagree" and 6 stands for "strongly agree". Each item on the questionnaire consists of a statement dealing with beliefs and feelings about behavior. The CFS was developed and standardized on a sample of student, and showed high internal consistency (α = .76-.77), good concurrent and construct validity with measures of interaction and communication flexibility and high test–retest reliability (r = .83) over two weeks.
- **Divergent Thinking Test:** Items from the Alternative Uses Task designed by Guilford (1967) measuring the divergent thinking is used. There are the four classifications: Ideation Fluency, Originality, Flexibility and Elaboration considered for the degree of Divergent Thinking. Guilford's Alternative Uses Task focus at request to enlist the same number of potential uses for basic house hold things, (such as brick, a paperclip, a newspaper). To gain insight into the kinds of thoughts produced by grown-ups on the AUT has a legitimate strategy. Test-retest reliability is 0.86 for adults. Construct validity is 0.72.

Research Design: 2X2 Factorial design was used to analyse the data.

Statistical Analysis: Two Way ANOVA was done for quantitative data analysis and results.

RESULTS

The main purpose of analysis and interpretation was to find the effect of the independent variables on dependent variables. The Table 1 displays the means and SD for the variables i.e. Areas (Rural and Urban) Cognitive Flexibility (Low and High) and Divergent Thinking of Undergraduate Students considered for investigation here.

Table 1: Showing the Mean score and SD of Areas (Rural and Urban) Cognitive Flexibility (Low and High) and Divergent Thinking of Undergraduate Students.

Area	Cognitive Flexibility	Mean	Std. Deviation	N
Rural	Low	21.09	7.164	22
	High	25.45	10.689	22
	Total	23.27	9.259	44
Urban	Low	27.63	9.537	35
	High	33.10	10.406	41
	Total	30.58	10.321	76
Total	Low	25.11	9.207	57
	High	30.43	11.048	63
	Total	27.90	10.517	120

From the mean scores it is indicated that Areas (Rural and Urban) and Cognitive Flexibility show better Divergent Thinking of Undergraduate Students. Further, the data was subjected to the analysis of variance and the results are displayed in Table 2 sequentially.

Table 2: Summary of Analysis of variance for the effect Areas (Rural and Urban) Cognitive Flexibility (Low and High) and Divergent Thinking of Undergraduate Students.

Source	Sum of Squares	df	Mean Square	F	Sig.
Intercept	79982.848	1	79982.848	851.11**	0.000
Areas	1397.724	1	1397.724	14.87**	0.000
CF	671.996	1	671.996	7.15**	0.009
Areas * CF	8.492	1	8.492	0.090	0.764
Error	10901.054	116	93.975		
Total	106572.000	120			

****p<0.01**

It is evident from the Table 2, that the F value =14.87 for Areas (Rural and Urban) on Divergent Thinking, is significant at 0.01 level (where p< 0.01). This means that Areas (Rural and Urban) have an effect on Divergent Thinking. Mean scores (Table 1) indicate higher divergent thinking in students in urban areas (M=30.58) as compare to those in rural areas (M=23.27). The F value equal to 7.15 in Table 2 for the effect of Cognitive Flexibility on Divergent Thinking, is also significant at 0.01 level(p<0.01). Further the mean scores for students with higher cognitive flexibility (M=30.43) show better divergent thinking as compare to the students with low cognitive flexibility (M= 25.11).

But, the interaction effect of Areas (Rural and Urban) and Cognitive Flexibility on Divergent Thinking of Undergraduate Students is not significant, where p>0.05 level. This is also evident from the graphical plots (Figure 1) representing the interaction effect, where the interaction lines do not intersect each other explaining a no interaction effect.

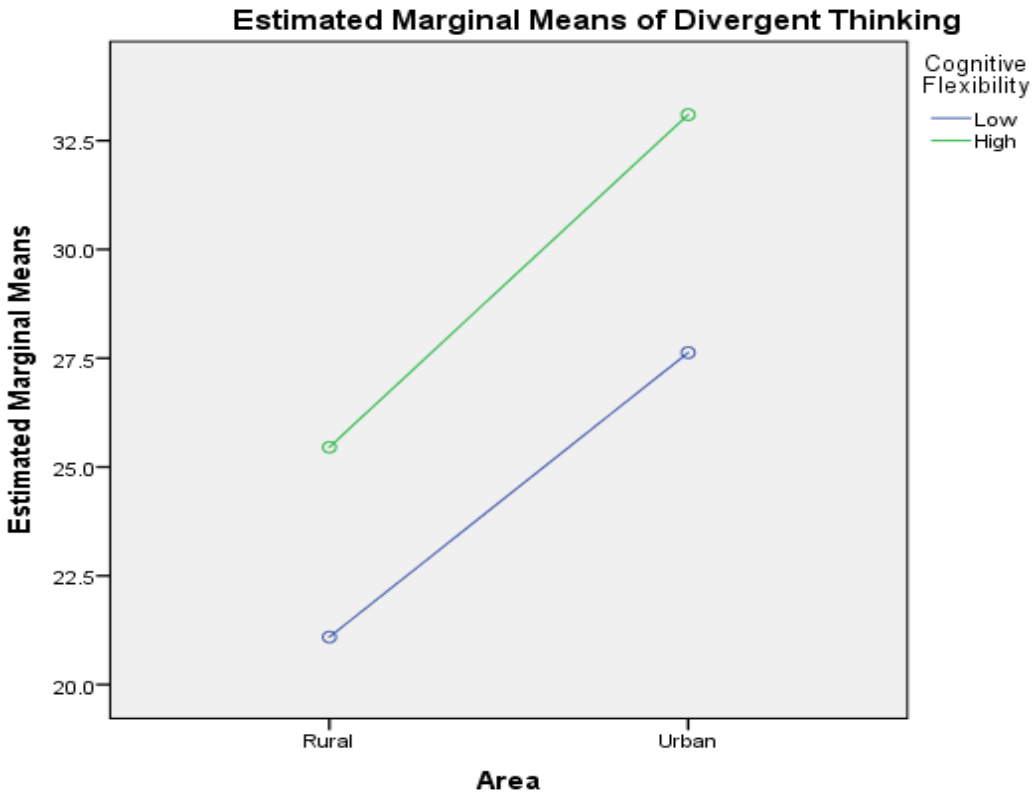

Figure 1: Graphical representation for interaction effect of the Areas (Rural and Urban) and Cognitive Flexibility on Divergent Thinking of Undergraduate Students.

Findings

- According to the data analysed and results obtained the H_1 i.e there would be significant effect of Cognitive Flexibility on Divergent Thinking of Undergraduate Students is accepted.
- H_2 i.e. There would be significant effect of Rural and Urban areas on Divergent Thinking of Undergraduate Students is also accepted.
- However, H_3 i.e there would be significant interaction effect of Rural and Urban areas and Cognitive Flexibility on Divergent Thinking of Undergraduate Students is rejected indicating no interaction effect of areas and cognitive flexibility on divergent thinking.

DISCUSSION

Cognitive Flexibility and Rural and Urban areas have significant effect on Divergent Thinking. When a student have cognitive ability that allows him to adapt to new situations and generate creative solutions to problems through divergent thinking. Ritter and Mostert (2017) found that divergent thinking skills, the training also improved convergent thinking and produced marginal improvements in creative problem solving skills and these improvements happens because of Cognitive Flexibility. But which area is better for cognitive flexibility is not specific and varies from situation to situation. So, Area and cognitive flexibility have not shown interaction effect.

CONCLUSION

On the basis of the findings, it is concluded that the effect Rural and Urban areas and Cognitive Flexibility on Divergent Thinking of Undergraduate Students is significant while interaction effect of Rural and Urban areas and Cognitive Flexibility on Divergent Thinking is not significant.

Implications

The study can be utilized by the students in understanding the role of cognitive flexibility in different daily life situations. It has research implications also and could be useful in the research for the other population groups as well. The research can be applied in creating awareness in the students towards the significance of cognitive flexibility and divergent thinking. This study is also useful to understand the role of our surroundings. It has implications for the students from rural area who might feel inferior to those in the urban area in terms of their mental abilities.

Limitations

Many a times, researchers are unable to carry the research task perfectly due to unavoidable situations. No research is a complete research and every research has a room for improvement. Here, are some limitations and suggestions for further research:

- The study was conducted on a sample of 120 students only.
- Area of research is limited to three cities of Uttar Pradesh only. The research may be conducted across the continent to validate the results along with other statistical analysis like mediating role of different variables and generalize the results.
- Students from tribal areas may also be included.
- Technical and non-technical academic programs to be compared.
- Also, Age group of respondents can be diverse for the sample currently considered.
- Further, any expert suggestions would be highly appreciated.

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Conflict of Interest

The author(s) declared no conflict of interest.

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