PERCEPTUAL SPEED OF HIGH SCHOOL STUDENTS AS PREDICATORS OF ACHIEVEMENT IN MATHEMATICS

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Abstract*:*

The present study was established to examine the effectof perceptual speed of high school students as predictors of mathematics achievement. A sample of 500 studentswas selected randomly and stratified in to locale , gender and type of schools from Palwaldistt.Haryana.A self madetest made by was employed with three five levels word comparison ,figure comparison, comparison of Roman-numerals ,Number /Formula comparison &Figure identification .The analysis was done by correlation n t-test.The findings suggested that Boys, Girls, Urban, Rurals have identical perceptual speed but there is a significant difference in govt. and private school.

1 .INTRODUCTION

Mathematics is useful, mathematics is beautiful and Mathematics disciplines the mind. Mathematics is the science of numbers and space. It deals with quantitative aspects of our life. It helps us in reaching necessary conclusions and interpreting various ideas with useful meanings. It provides opportunities for intellectual exercise of our mind. Mathematics has been called "the queen of the sciences" it is more than the art of computation. In the real sense, it is a science of space and quantity that helps us in solving the problems of life needing numerations and calculations. It provides opportunities for the intellectual gymnastic of human's inherent powers. It is an exact science and involves high cognitive abilities and powers.

How do human beings learn?Psychologist have developed different perspective to give a comprehensive answer to the above question .Psycoanalists like (Freud), Humanist(Maslow),cognitive(piaget&Bruner),socialconstructivists(vygotasky),multiple intelligence (Gardner)and others are among them.Piaget theory of of learning is the corner stone of the modern state of understanding how human learn cognitive psychology sees the individual as as a processor of information,setting up An internal model of the world and developing plans and strategies to guide ways of interacting with it to achieve goals Piaget postulated that there are mental structures that determine how new information is perceived. Bruner upholds that learning is an active process in which learners construct new ideas of concept basedon their current or prior knowledge.Vygotsky believes that children learning and developmentcan be best under stoodin terms of acquisition of their culture which he calls social constructivism.

Constructavism:

A theory without a practice is fruitless and practice without a theory is rootles. Thus, it can be asserted and highlighted that an understanding of theoretical underpinning has to be at eh axis of whole scheme of practical affairs. Needless to say that theoretical perspective provides us extensive as well as intensive insights. Constructivist thinking can be capsulated in the saying that every reality is a constructed reality and there is nothing like ultimate reality. This very perspective has to be brought into the epistemological and pedagogical realms of educational affairs in general and teaching, learning and assessment in particular.

In recent times, educators and institutional discourse has begun to challenge the objectivist view, with an increasing appreciation of different ways of knowing the world. Constructivist writers in education have described varied versions of constructivism, but commonly acknowledged is the active role of the learner in interpretation of reality. They challenge the objectivist view that suggests "facts speak for themselves" and that knowledge is the reflection of ontological reality, and that language objectively refers to this reality. The constructivism alternativism philosophy suggests that our constructions and views of the world are not stable, but are in continuous change as we build on past experiences. This change signifies learning and supports the understanding that as human beings, we are always construing and learning, and we are never inert.

Perception

The world around us consists of various levels of physical energy. Our knowledge of the world comes through our sense organs, which react to these energies. The sense organs change the various environmental energies into nervous impulses, whichgo to the brain. Through the psychological process of perception. these pattern's~be\come known as objects, events. people and other aspects of the world. in the perception of shape, lies the beginning of concept formation. Whereas the optical image projected upon In a broader and more general sense, the term perception refers to the mental experience which arises whenever one recognises some object that is presented to the senses it is different from sensation, which is relatively a simple experience, which is derived from the stimulation of senses. it includes recognition, supplemented by earlier knowledge. Therefore, perception may be described as a complex of sensations and memory experiences. Thus a visual percept is dependent on the visual sensations fused with factual sensations, motor sensations and memory factors. The orderly arrangement of all these sensations gives rise to the spatial, temporal and other characteristics of the percept. Form and size are therefore the products of perceptual fusion and not any simple sensory factors and the unity of a percept depends upon the perceptual process itself.

Sensation and perception is the starting point for all other areas of psychology. Behaviour and thinking is based on a chain (or perhaps better network) of information processing: bottom-up processes transmit information into higher areas of the human nervous system, lower areas are moderated through top down process.

Objectives Of The Study

- To find out the interrelationship between Perceptual Speed and Mathematics Achievement taken in pairs for the whole sample and relevant sub-sample.

- To find out interrelationship between Mathematics Achievement and Each of the independent variables when effect of other variables is paralleled out

Hypotheses

There is no significant relationship between spatial ability, perceptual speed and mathematical achievement of high school students.

Definition of terms

Perceptual Speed

Perceptual Speed refers tothe rate of pertaining to the power or act of perceiving.

Predictors

Something such as an event or fact that enable to say what will happen in future.

Variables Of The Study

Perceptual Speed variables

1 Perceptual Speed 1 (Word comparison)
2 Perceptual Speed 2 (Figure comparison)
3 Perceptual Speed 3 (Comparison of Roman numerals)
4 Perceptual Speed 4 (Number/Formula comparison)
5. Perceptual Speed (Figure identification)

SAMPLE

The data required for the study were collected from a sample of 500 students studying in class IX of selected schools Palwal. The Sample was selected techniques with representation given to factors like school efficiency, rural-urban residence of subjects, sex of subjects, and type of school.

Tool Used For The Study

The data for the study has been obtained using the following tools.

1. Achievement test in Mathematics
2. Perceptual Speed Test

Analysis:

THE COEFFICIENTS OF CORRELATION BETWEEN PERCEPTUAL SPEED AND MATHEMATICS ACHIEVEMENT FOR THE WHOLE SAMLE

Variables correlated with Mathematics Achievement		Value of r	N
Perceptual Speed		0.718**	
Sub-tests of Perceptual Speed	Word Comparison	0.625**	
	Figure Comparison	0.606**	
	Comparison of Roman Numerals	0.583**	
	Number/Formula Comparison	0.575**	
	Figure Identification	0.622**	500

From the results it is evident that there exist significant positive relation between Perceptual Speed and Mathematics Achievement of students.

THE COEFFICIENTS OF CORRELATION BETWEEN PERCEPTUAL SPEED AND MATHEMATICS ACHIEVEMENT FOR BOYS

Variables correlated with Mathematics Achievement		Value of r	N
Perceptual Speed		0.667**	
Sub-tests of Perceptual Speed	Word Comparison	0.579**	
	Figure Comparison	0.552**	
	Comparison of Roman Numerals	0.579**	
	Number/Formula Comparison	0.509**	
	Figure Identification	0.553**	321

From the results it is evident that there exist significant positive correlation between Perceptual Speed and Mathematics Achievement of boys.

THE COEFFICIENTS OF CORRELATION BETWEEN PERCEPTUAL SPEED AND MATHEMATICS ACHIEVEMENT FOR GIRLS

Variables correlated with Mathematics Achievement		Value of r	N
Perceptual Speed		0.804**	
Sub-tests of Perceptual Speed	Word Comparison	0.718**	
	Figure Comparison	0.705**	
	Comparison of Roman Numerals	0.589**	
	Number/Formula Comparison	0.690**	
	Figure Identification	0.741**	179

From the results it is evident that there exist significant positive correlation between Perceptual Speed and Mathematics Achievement of Girls.

THE COEFFICIENTS OF CORRELATION BETWEEN PERCEPTUAL SPEED AND MATHEMATICS ACHIEVEMENT FOR STUDENTS STUDYING IN URBAN AREA

Variables correlated with Mathematics Achievement		Value of r	N
Perceptual Speed		0.738**	
Sub-tests of Perceptual Speed	Word Comparison	o.657**	
	Figure Comparison	0.629**	
	Comparison of Roman Numerals	0.615**	
	Number/Formula Comparison	0.575**	
	Figure Identification	0.644**	276

From the results it is evident that there exist significant positive correlation between Perceptual Speed and Mathematics Achievement of students studying in urban area.

THE COEFFICIENTS OF CORRELATION BETWEEN PERCEPTUAL SPEED AND MATHEMATICS ACHIEVEMENT FOR STUDENTS STUDYING IN RURAL AREA

Variables correlated with Mathematics Achievement		Value of r	N
Perceptual Speed		0.692**	
Sub-tests of Perceptual Speed	Word Comparison	0.588**	
	Figure Comparison	0.575*	
	Comparison of Roman Numerals	0.544**	
	Number/Formula Comparison	0.571**	
	Figure Identification	0.593	224

From the results it is evident that there exist significant positive correlation between Perceptual Speed and Mathematics Achievement of students studying in rural area. All sub-tests of perceptual speed test significant relation with achievement in mathematics for the students studying in rural area.

THE COEFFICIENTS OF CORRELATION BETWEEN PERCEPTUAL SPEED AND MATHEMATICS ACHIEVEMENT FOR STUDENTS STUDYING IN GOVERNMENT SCHOOLS

Variables correlated with Mathematics Achievement		Value of r	N
Perceptual Speed		0.708**	
Sub-tests of Perceptual Speed	Word Comparison	0.638**	
	Figure Comparison	0.581**	
	Comparison of Roman Numerals	0.611**	
	Number/Formula Comparison	0.602**	
	Figure Identification	0.637**	196

From the results it is evident that there exist significant positive correlation between Perceptual Speed and Mathematics Achievement of students studying in Government Schools.

THE COEFFICIENTS OF CORRELATION BETWEEN PERCEPTUAL SPEED AND MATHEMATICS ACHIEVEMENT FOR STUDENTS STUDYING IN PRIVATE SCHOOLS

Variables correlated with Mathematics Achievement		Value of r	N
Perceptual Speed		0.205**	
Sub-tests of Perceptual Speed	Word Comparison	0.100	
	Figure Comparison	0.170*	
	Comparison of Roman Numerals	0.34	
	Number/Formula Comparison	0.062	
	Figure Identification	0.143*	304

From the results it is evident that there exist significant positive correlation between Perceptual Speed and Mathematics Achievement of students studying in rural area. All sub-tests of perceptual speed test expect word comparison and number formula comparison has no significant relation with achievement in mathematics for the students studying in private schools.

INDEPENDENT EFFECT OF SUB TESTS OF PERCEPTUAL SPEED ON MATHEMATICS ACHIEVEMENT

Variables	Partial Correlation coefficient	N	Controlled Variables						
Achievement with Word Comparison (P1)	0.176		P5	P2	P3	P4	S1	S2	S3
Achievement with Figure Comparison (P2)	0.110		P1	P5	P3	P4	S1	S2	S3
Achievement with Comparison of Roman Numerals (P3)	0.141	500	P1	P2	P5	P4	S1	S2	S3
Achievement with Number/Formula Comparison (P4)	0.035		P1	P2	P3	P5	S1	S2	S3
Achievement with Figure Identification (P5)	0.194		P1	P2	P3	P4	S1	S2	S3

**significant at 0.01; level *significant at 0.05; level

S1=Block Counting S2=Figure Rotation S3=Paper Form Board
P1=Word Comparison P2=Figure Comparison P3=Comparison of Roman Numerals
P4=Numbers/Formula Comparison P5=Figure Identification

Conclusion:

From the analysis of the correlation coefficients it can be concluded that there exists significant positive correlation between spatial ability and mathematics achievement of students for the total sample and for all the sub samples except word comparison and number/formula comparison.

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