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Comparative study of academic achievement of adolescent girls with different magnitudes of motor educability

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Abstract

This study explored the association of motor educability with academic achievement of adolescent girls. This study was conducted on 250 adolescent girls chosen from Jammu and Kashmir. 50 adolescent girls each from 13 to 17 years ages were selected as sample. Modified version of Johnson Motor Educability Test was used to assess magnitude of motor educability among selected adolescent girls. Academic achievement of selected adolescent girls was evaluated on the basis of previous year examination grades/marks. Quartile method was employed to bifurcate adolescent girls into high, average and low level of motor educability. The results obtained through One Way ANOVA indicate that academic achievement of adolescent girls placed in high motor educability group was significantly superior as compared to adolescent girls placed in average and low level of motor educability. The results are discussed in the light of established theories on motor skill and cognition.

Keywords: Motor educability; adolescent girls; academic achievement

1. Introduction

Motor educability refers to the ability to learn or the cognitive capacity to learn new skills. It is believed that some neurons in the brain are equally responsible for motor development as well as cognitive tasks. It is advocated that stronger association between these two neurons may also be effective in enhanced academic achievement. It is also contended that superior motor development leads to strong association between neurons and it also assist in academic related activities. It has been documented that well developed fine motor skills allows better coordination and adjustment to surrounding environment which aids in academic success also. In nutshell without proper fine motor skills it is not possible to excel in academics.

Extensive research has been conducted by researchers to explore the possible linkage between motor proficiency and academic proficiency. Some of the researchers like have found positive association between motor proficiency and academic achievement (Mayes *et al.* 2009; Pagani, 2012; Van Niekerk *et al.*, 2015; Pitchford *et al.* 2016) ^[4, 7, 6] while others quoted no relationship between these two variables (Kurdek and Sinclair, 2001; Haapala *et al.*, 2014; Jaakkola *et al.*, 2015) ^[3, 5, 1, 2]. So the results in this regard are still inconclusive. Hence it is essential to have knowledge regarding the role of motor educability in academic settings so that more efficient physical exercise program can be incorporated in physical education classes. Hence the present study was planned to find out the effect of motor educability on academic achievement of adolescent girls.

1.1 Objectives: The objective of the present study is to assess academic achievement of adolescent girls on the basis of motor educability.

1.2 Hypothesis: It was hypothesised that academic achievement of adolescent girls will be influenced by their level of motor educability.

2. Methodology: The following methodological steps were taken in order to conduct the present study.

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2.1 Sample: To conduct the study, 250 adolescent girls from Jammu and Kashmir were selected. Equal number of subjects were selected from age group 13+ years age, 14+ years age, 15+ years age, 16+ years age and 17+ years age respectively. Random sampling was used for selection of sample.

2.2 Tools: Motor Educability Test: Modified version of Johnson's test of motor educability (1932) with four items namely front roll, back roll, jumping half turns and jumping full terms was used to assess motor educability of selected subjects. This test is highly reliable and valid.

2.2.1 Academic Achievement: Academic achievement of the selected subject was assessed by their previous year academic marks.

2.3 Procedure

- 250 adolescent girls with age range of 13 to 17 years were selected randomly. After written voluntary consent from subjects, they were

subjected to four items of Johnson's motor educability test. The scores on each item were summed up.

- Last year's academic marks were obtained from respective schools records.
- To distribute subjects with high, average and low level of motor educability, Q_1 and Q_3 statistical technique was used. The 25th percentile score on motor educability test was 19.00 while the 75th percentile score was 32. The scores of adolescent girls falling above P_{75} (Q_3) were considered as high level of motor educability, scores lying below P_{25} (Q_1) were considered as low level of motor educability while scores between the above quartile treated as average level of motor educability. To compare academic achievement of adolescent girls so distributed in high, average and low motor educability group, One Way ANOVA and Least Significant Difference Test was used. The results are presented in table 1 and 2 respectively.

3. Results

Table 1: Descriptive Statistics of Scores on Academic Achievement among Adolescent Girls with Varying Degree of Motor Educability (N=250)

Groups	N	Academic Achievement	
		Mean	S.D.
Adolescent Girls - High Motor Educability	73	86.46	14.04
Adolescent Girls - Average Motor Educability	111	76.90	17.21
Adolescent Girls- Low Motor Educability	66	66.86	13.03
F=28.44, p<.01			

The F=28.44 shown in table 1 indicate that academic achievement of adolescent girls showing evidence of high level of motor educability (M=86.46), average level of motor educability (M=76.90) and low level of motor educability

(M=66.86) differ significantly. The obtained result shown in table 1 was also confirmed by Least Significant Difference Test presented in table no. 2.

Table 2: Comparison of Mean Scores on Academic Achievement in a Group of Adolescent Girls with High, Moderate and Low Motor Educability (N=250), Least Significant Difference Test with Significance Level .05

Mean (I)	Mean (J)	Mean Difference (I-J)
Adolescent Girls with High Motor Educability	Adolescent Girls with Moderate Motor Educability	9.55*
	Adolescent Girls with Low Motor Educability	19.60*
Adolescent Girls with Moderate Motor Educability	Adolescent Girls with Low Motor Educability	10.04*

* Significant at .05 level

Statistical data shown in table 2 gives following inferences:

- Academic achievement of adolescent girls showing signs of high level of motor educability was found to be significantly superior as compared to adolescent boys showing average and low level of motor educability. The mean difference of 9.55 and 19.60 was found to be statistically significant at .05 level.
- Academic achievement of adolescent girls showing average level of motor educability was found to be significantly superior as compared to adolescent girls showing low level of motor educability. The mean difference of 10.04 was found to be statistically significant at .05 level.

On the basis of analysis of data, following results are obtained:

4. Discussion

In number of studies relationship of motor skills was observed with reading skills and achievement in mathematics. In the present study the overall academic achievement of adolescent girls was found to be significantly dependent on their motor

educability. Hence results once again reiterate the importance of motor educability as far as academic achievement is concerned.

5. Conclusion

On the basis of results, it was concluded that motor educability is strongly associated with academic achievement of adolescent girls. It may also be concluded that ability to learn or the cognitive capacity to learn new motor skills positively reflects in academic achievement of adolescent girls.

6. References

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