

An Interaction Effect of Urban Students Mental Health, Emotional Intelligence and Attitude on Academic Achievement in Science Among Secondary School Students

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Abstract

The purpose of the study was to analyze independent and combined effects of variables viz., Mental health (high and low), Emotional intelligence (high and low) and Attitude (favorable and unfavorable) on Academic achievement in Biological Science. The sample of the present study includes 265 urban students studying in IX standard were drawn using stratified random sampling technique. Among the other things, the study revealed that, i) the Urban students with high Mental health have more influence on Academic achievement in Biological science than the Urban students with low Mental health; ii) the Urban students with high Mental health and low Emotional intelligence have more influence on Academic achievement in Biological science than the Urban students with low Mental health and high Emotional intelligence; iii) the Urban students with high Mental health, high Emotional intelligence and favorable Attitude towards science have more influence on Academic achievement in Biological science than the Urban students with low Mental health, low Emotional intelligence and unfavorable Attitude towards science.

Key words

Mental health, Emotional intelligence, Academic achievement

Introduction

Man is a psychophysical organism. His mental and physical health depends on each other. Weave experience that any defect in any body organ creates a storm in the mind, we become restless and as an effect some changes occur in our behavior. Also the restlessness in our mind influences the body activities. The persons who are happy by the mind possess physical health and the persons who are physically healthy also live mentally healthy. It is evident that physical and mental health depends on each other. Hence we infer that they have positive correlation. A man who is mentally healthy accepts the reality of his environment and adopts himself accordingly with it. Psychologists look at mental health in the form of ability of good adjustment. Persons with good mental health are free from negative emotions such as fear, anxiety and anger. They are self confident and take themselves as secure.

According to the 2004 World Health Report of the World Health Organization (WHO), approximately 20% of individuals under the age of 18 years suffer from developmental, emotional or behavioural problems, and one in eight could be diagnosed with a psychiatric disorder. Worldwide, increasing attention has been focused on the primary prevention of mental illness and a number of initiative targeting young persons have been undertaken to promote mental health and reduce vulnerability to mental illness.

Rationale for the Study

Gouri Sharma(2017) revealed that stress and academic achievement found to be significant positive association with each other. It is concluded that mental health condition of the students affect academic achievements. Shashikala (2015) found that high achiever group was mentally healthy than low achiever group. Mental health was positively related with academic achievement. Thilagavathy (2014) revealed that the student of different achievement groups (high, average and low) seems to possess different mental health. And also it is found that there is a positive and significant relationship between academic achievement and mental health. Jasbir Kaur and Babita Arora(2014) found that there is a highly significant relationship between academic achievement

and certain dimensions of mental health namely overall adjustment and intelligence for the sample as a whole. Mukul Bavan Mandal (2017) revealed that there exists a significant relationship between emotional intelligence and academic achievements of the rural upper primary students. Torbate, Heydariel, Iran (2015) found that there is no significant relationship between Emotional intelligence and Academic achievement but the relationship between creative thinking and academic achievement was positive and significant. Azuka Benard Festus (2012) revealed that apart from cognitive factors, Emotional intelligence also affects their academic achievement in mathematics. Chamundeshwari (2013) found that there is a positive significant correlation between Emotional intelligence and Academic achievement among the students. Kattekar (2010) conducted a study to investigate the impact of emotional intelligence on the academic achievement in Kannada language of 500 standard IX students in the Karnataka state. He found a positive relationship between emotional intelligence and academic achievement of students. OWOEYE, Pius Olatunji (2016) revealed that there is a significant relationship in the students attitude to biology and students academic performance in biology and the findings also revealed that there is significant relationship in the students interest in biology and students academic performance in biology. Kar(1990) studied relationship between attitude towards science and achievement in general science of class IX students of Cuttack city and found that, there was positive relationship between attitude and achievement ; Boys were found to be more favorably disposed towards science than Girls. Ngailian and Corloline (1991) studied selected variables associated with achievement in mathematics and found that, there was a significant association between attitude towards mathematics and achievement in mathematics. Narmada and Chamundeshwari (2013) showed a positive correlation between attitude towards learning science and academic achievement in science among the students.

Objectives

The present study was designed with the following objectives

in views:

- To study the effect of Urban students Mental health on Academic achievement in Biological science.
- To study the effect of Urban students Emotional intelligence on Academic achievement in Biological science.
- To study the effect of Urban students Attitude towards science on Academic achievement in Biological science.
- To study the interaction effect of Urban students Mental health and Emotional intelligence on Academic achievement in Biological science.
- To study the interaction effect of Urban students Mental health and Attitude towards science on Academic achievement in Biological science.
- To study the interaction effect of Urban students Emotional intelligence and Attitude towards science on Academic achievement in Biological science.
- To study the interaction effect of Urban students Mental health, Emotional intelligence and Attitude towards science on Academic achievement in Biological science

Hypotheses: In pursuance of the objectives (1-7), the following null hypotheses were set up.

- H_{01} : There is no significant difference between the effects of high and low Mental health of Urban students in terms of their influence on Academic achievement in Biological science.
- H_{02} : There is no significant difference between the effects of high and low Emotional intelligence of Urban students in terms of their influence on Academic achievement in Biological science.
- H_{03} : There is no significant difference between the effects of favourable and unfavourable Attitude towards Science of Urban students in terms of their influence on Academic achievement in Biological science.
- H_{04} : There is no significant difference between the Interaction effects of Mental health X Emotional intelligence of Urban students in terms of their influence on Academic achievement in Biological science.
- H_{05} : There is no significant difference between the Interaction effects of Mental health X Attitude towards science of Urban students in terms of their influence on Academic achievement in Biological science.
- H_{06} : There is no significant difference between the Interaction effects of Emotional intelligence X Attitude towards science of Urban students in terms of their influence on Academic achievement in Biological science.
- H_{07} : There is no significant difference between the Interaction effects of Mental health X Emotional intelligence X Attitude towards science of Urban students in terms of their influence on Academic achievement in Biological science.

Research Design: Ex Post Facto research design was used in the present study (Kerlinger, 1964 p. 379). Ex Post Facto research is systematic empirical inquiry in which the investigator does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulatable. Inferences about relations among variables are made, without direct intervention, from concomitant variation of independent and dependent variables.

Method

Sample: The sample of the present study includes 265 urban students studying in IX standard were drawn using stratified

random sampling technique among the Government and Private Secondary schools in Urban and Rural areas of Haveri district forms the sample

Tools: The following tools were used to collect the essential data:

- I. Mental Health Status Scale (MHSS)(1984) Developed by K.C.Baby prasanna and Mercy Abraham. The Scale Consists of 16 sub-scales which are meant to measure the 16- components identified as major mental health variables. The reliability was estimated by split half (odd-even) method and found to be 0.69 and by test-retest method found to be 0.78.
- II. Emotional Intelligence Scale (EIS) (2001) Developed by Anukool Hyde and Sanjyot Pethe. It consists of 25 items. The split-half reliability coefficient was found to be 0.88.
- III. Attitude towards Science Scale (ATSS) (2009) Developed by Anuradha Agnihotri. It is a five point scale and consists of 25 items. The reliability by test-retest method was 0.828.
- IV. Academic Achievement in Biological Science was constructed by the investigator. It consists of 54 items and the stability reliability was 0.9925(n=100) and consistency reliability was 0.8738 (n=100).

Procedure: Data relating to Mental health, Emotional intelligence, Attitude towards science and Academic achievement in Biological science were collected by administering the above tools to IX standard students studying in Haveri district.

Results : The data were analyzed using 3 –way ANOVA technique with a view to identify independent and combined effect of selected variables on Academic Achievement. The results of the analysis are given in Tables 1 to 2.

Analysis of Data pertaining to ‘Urban students’

Table-1 : Summary Table of ANOVA with Respect to ‘Urban students’

Source of Variation	df	Sum of Squares	Mean of Sum of Squares	F – Ratios	P - Value	Significance
Main effects						
Mental Health (A)	1	984.95	984.95	294.7048	<0.01	S
Emotional Intelligence (B)	1	18.08	18.08	5.4099	<0.05	S
Attitude (C)	1	34.22	34.22	10.2384	<0.01	S
2 way inter- actions						
MH x EI (A x B)	1	45.82	45.82	13.7097	<0.01	S
MH x Atti- tude (A x C)	1	17.11	17.11	5.1203	<0.05	S
EI x Attitude (B x C)	1	14.01	14.01	4.1919	<0.05	S
3way interac- tions						
MH x EI x Attitude (A x B x C)	1	30.92	30.92	9.2518	<0.01	S
Error	257	858.93	3.34			
Total	264	2004.04				

Findings

The analysis of Table-1 reveals the following

- 1) There is a significant difference between the effects of high and low Mental health of Urban students in terms of their influence on Academic achievement in Biological science. However, the means of Mental health scores of Urban students with high and low Mental health are 43.40 and 39.12 respectively. The two means clearly reveals that the Urban students with high Mental health have a greater mean than that of the mean of the Urban students with low Mental health. Thus, it can be interpreted that the Urban students with high Mental health have more influence on Academic achievement in Biological science than the Urban students with low Mental health.
- 2) There is a significant difference between the effects of high and low Emotional intelligence of Urban students in terms of their influence on Academic achievement in Biological science. However, the means of Emotional intelligence scores of Urban students with high and low Emotional intelligence are 47.09 and 37.33 respectively. The two means clearly reveals that the Urban students with high Emotional intelligence have a greater mean than that of the mean of the Urban students with low Emotional intelligence. Thus, it can be interpreted that the Urban students with high Emotional intelligence have more influence on Academic achievement in Biological science than the Urban students with low Emotional intelligence.
- 3) There is a significant difference between the effects of favorable and unfavorable Attitude towards science of Urban students in terms of their influence on Academic achievement in Biological science. However, the means of Attitude towards science scores of Urban students with favorable and unfavorable Attitude towards science are 43.34 and 39.09 respectively. The two means clearly reveals that the Urban students with favorable attitude towards science have a greater mean than that of the mean of the Urban students with unfavorable Attitude towards science. Thus, it can be interpreted that the Urban students with favorable Attitude towards science have more influence on Academic achievement in Biological science than the Urban students with unfavorable Attitude towards science.
- 4) There is significant difference between the interaction effects of high/low Mental health and high /low Emotional intelligence of Urban students in terms of their influence on Academic achievement in Biological science.
- 5) There is a significant difference between the interaction effects of high/low Mental health and favorable/unfavorable Attitude towards science of Urban students in terms of their influence on Academic achievement in Biological science.
- 6) There is a significant difference between the interaction effects of high/low Emotional intelligence and favorable/unfavorable Attitude towards science of Urban students in terms of their influence on Academic achievement in Biological science.
- 7) There is a significant difference between the interaction effects of high/low Mental health, high/low Emotional intelligence and favorable /unfavorable Attitude towards science of Urban students in terms of their influence on Academic achievement in Biological science.

Multiple Comparisons of Means – ‘Urban students’

Scheffe’s simultaneous confidence intervals for all possible treatment groups pertaining to the Urban students are given below:

Table 2 : Comparison of Means of Treatment Groups on Urban students- Scheffe’s Simultaneous Confidence Intervals

S I No.	Comparison of treatment groups	Corresponding means		Simultaneous Confidence Intervals		P-value	Significance
1	a ₁ x b ₁ x a ₁ x b ₂	47.89	44.82	2.96	4.77	<0.05	S
2	a ₁ x b ₁ x a ₂ x b ₂	47.89	38.48	8.65	9.76	<0.05	S
3	a ₁ x b ₂ x a ₂ x b ₁	44.82	36.59	7.17	9.29	<0.05	S
4	a ₁ x c ₁ x a ₂ x c ₁	48.75	46.50	8.55	9.71	<0.05	S
5	a ₁ x c ₁ x a ₂ x c ₂	48.75	47.00	11.78	13.16	<0.05	S
6	a ₂ x c ₁ x a ₂ x c ₂	37.80	32.38	3.57	5.12	<0.05	S
7	b ₁ x c ₁ x b ₂ x c ₁	50.52	40.42	2.80	3.03	<0.05	S
8	b ₁ x c ₁ x b ₂ x c ₂	47.00	43.05	3.50	5.50	<0.05	S
9	a ₁ x b ₁ x c ₁ x a ₁ x b ₂ x c ₂	47.00	46.00	0.70	2.85	<0.05	S
10	a ₁ x b ₁ x c ₁ x a ₂ x b ₁ x c ₂	44.55	35.75	12.45	12.60	<0.05	S
11	a ₁ x b ₁ x c ₂ x a ₁ x b ₂ x c ₁	47.11	45.81	0.50	3.20	<0.05	S

Note:

1. Comparison of other treatment groups of Urban students were found to be not significant.
2. Higher the mean scores indicate higher influence of independent variables on dependent variable.

Table 2 reveals the following

01. As the simultaneous confidence interval values of SI. No.1 are in the same direction i.e. +2.96 and +4.77 the difference is significant. Hence, the means of the treatment groups a₁b₁ (47.89) and a₂b₂ (44.82) differ significantly in respect of their influence on Academic achievement in science. However, the observation of the two means clearly indicates that, the mean of the treatment group a₁b₁ is greater than the mean of the treatment group a₁b₂. This further implies that the Urban students with high Mental health and high Emotional intelligence have more influence on Academic achievement in Biological science than the Urban students with high Mental health and low Emotional intelligence.
02. As the simultaneous confidence interval values of SI. No.2 are in the same direction i.e. +8.65 and +9.76 the difference is significant. Hence, the means of the treatment groups a₁b₁ (47.89) and a₂b₂ (38.48) differ significantly in respect of their influence on Academic achievement in science. However, the observation of the two means clearly indicates that, the mean of the treatment group a₁b₁ is greater than the mean of the treatment group a₂b₂. This further implies

- that the Urban students with high Mental health and high Emotional intelligence have more influence on Academic achievement in Biological science than the Urban students with low Mental health and low Emotional intelligence.
03. As the simultaneous confidence interval values of Sl. No.2 are in the same direction i.e. +7.17 and +9.29 the difference is significant. Hence, the means of the treatment groups a_1b_2 (44.82) and a_2b_1 (36.59) differ significantly in respect of their influence on Academic achievement in science. However, the observation of the two means clearly indicates that, the mean of the treatment group a_1b_2 is greater than the mean of the treatment group a_2b_1 . This further implies that the Urban students with high Mental health and low Emotional intelligence have more influence on Academic achievement in Biological science than the Urban students with low Mental health and high Emotional intelligence.
04. As the simultaneous confidence interval values of Sl. No.4 are in the same direction i.e. +8.55 and +9.71 the difference is significant. Hence, the means of the treatment groups a_1c_1 (48.75) and a_2c_1 (46.50) differ significantly in respect of their influence on Academic achievement in science. However, the observation of the two means clearly indicates that, the mean of the treatment group a_1c_1 is greater than the mean of the treatment group a_2c_1 . This further implies that the Urban students with high Mental health and favorable Attitude towards science have more influence on Academic achievement in Biological science than the Urban students with low Mental health and favorable Attitude towards science.
05. As the simultaneous confidence interval values of Sl. No.5 are in the same direction i.e. +11.78 and +13.16 the difference is significant. Hence, the means of the treatment groups a_1c_1 (48.75) and a_2c_2 (47.00) differ significantly in respect of their influence on Academic achievement in science. However, the observation of the two means clearly indicates that, the mean of the treatment group a_1c_1 is greater than the mean of the treatment group a_2c_2 . This further implies that the Urban students with high Mental health and favorable Attitude towards science have more influence on Academic achievement in Biological science than the Urban students with low Mental health and unfavorable Attitude towards science.
06. As the simultaneous confidence interval values of Sl. No.6 are in the same direction i.e. +3.57 and +5.12 the difference is significant. Hence, the means of the treatment groups a_2c_1 (37.80) and a_2c_2 (32.38) differ significantly in respect of their influence on Academic achievement in science. However, the observation of the two means clearly indicates that, the mean of the treatment group a_2c_1 is greater than the mean of the treatment group a_2c_2 . This further implies that the Urban students with low Mental health and favorable Attitude towards science have more influence on Academic achievement in Biological science than the Urban students with low Mental health and unfavorable Attitude towards science.
07. As the simultaneous confidence interval values of Sl. No.7 are in the same direction i.e. +2.80 and +3.03 the difference is significant. Hence, the means of the treatment groups b_1c_1 (50.52) and b_2c_1 (40.42) differ significantly in respect of their influence on Academic achievement in science. However, the observation of the two means clearly indicates that, the mean of the treatment group b_1c_1 is greater than the mean of the treatment group b_2c_1 . This further implies that the Urban students with high Emotional intelligence and favorable Attitude towards science have more influence on Academic achievement in Biological science than the Urban students with low Emotional intelligence and favorable Attitude towards science.
08. As the simultaneous confidence interval values of Sl. No.8 are in the same direction i.e. +3.50 and +5.50 the difference is significant. Hence, the means of the treatment groups b_1c_1 (47.00) and b_2c_2 (43.05) differ significantly in respect of their influence on Academic achievement in science. However, the observation of the two means clearly indicates that, the mean of the treatment group b_1c_1 is greater than the mean of the treatment group b_2c_2 . This further implies that the Urban students with high Emotional intelligence and favorable Attitude towards science have more influence on Academic achievement in Biological science than the Urban students with low Emotional intelligence and unfavorable Attitude towards science.
09. As the simultaneous confidence interval values of Sl. No.11 are in the same direction i.e. +0.70 and +2.85 the difference is significant. Hence, the means of the treatment groups $a_1b_1c_1$ (47.00) and $a_1b_2c_2$ (46.00) differ significantly in respect of their influence on Academic achievement in science. However, the observation of the two means clearly indicates that, the mean of the treatment group $a_1b_1c_1$ is greater than the mean of the treatment group $a_1b_2c_2$. This further implies that the Urban students with high Mental health, high Emotional intelligence and favorable Attitude towards science have more influence on Academic achievement in Biological science than the Urban students with high Mental health, low Emotional intelligence and unfavorable Attitude towards science.
10. As the simultaneous confidence interval values of Sl. No.12 are in the same direction i.e. +12.45 and +12.60 the difference is significant. Hence, the means of the treatment groups $a_1b_1c_1$ (44.55) and $a_2b_1c_2$ (35.75) differ significantly in respect of their influence on Academic achievement in science. However, the observation of the two means clearly indicates that, the mean of the treatment group $a_1b_1c_1$ is greater than the mean of the treatment group $a_2b_1c_2$. This further implies that the Urban students with high Mental health, high Emotional intelligence and favorable Attitude towards science have more influence on Academic achievement in Biological science than the Urban students with low Mental health, high Emotional intelligence and unfavorable Attitude towards science.
11. As the simultaneous confidence interval values of Sl. No.13 are in the same direction i.e. +0.50 and +3.20 the difference is significant. Hence, the means of the treatment groups $_{alb1c2}$ (47.11) and $_{alb2c1}$ (45.81) differ significantly in respect of their influence on Academic achievement in science. However, the observation of the two means clearly indicates that, the mean of the treatment group $a_1b_1c_2$ is greater than the mean of the treatment group $a_1b_2c_1$. This further implies that the Urban students with high Mental health, high Emotional intelligence and unfavorable Attitude towards science have more influence on Academic achievement in Biological science than the Urban students with high Mental health, low Emotional intelligence and favorable Attitude towards

science.

Conclusions

- I. In the present study the researcher hypothesized that student with high and low Mental health differs significantly in terms of their effects on Academic achievement in Biological science. Findings of the study clearly revealed that students with high Mental health have more influence on Academic achievement in Biological science than the students with low Mental health this may due to the reason that, Mentally healthy person is self acceptant and has reasonably high self-esteem, feels generally adequate, but recognizes his own short comings and seeks to improve, is well balanced, flexible and consistent in his attitudes, goals and deals attempts to solve his problems, rather than to escape them or to employ defense mechanisms excessively. These characteristics help in higher achievement.
- II. In the present study the researcher hypothesized that student with high and low Emotional intelligence differs significantly in-terms of their effects on Academic achievement in Biological science. Findings of the study clearly revealed that students with high Emotional intelligence have more influence on Academic achievement in Biological science than the students with low Emotional intelligence. This may be due to the following characteristics and abilities like, Self motivation, Impulse control, the ability to regulate one's own emotions and empathizing with others clearly, excel socially, are outgoing and cheerful, are rarely fearful and worried, and are systematic and carrying in their relationship, knowing ones emotions, managing emotions, recognizing emotions in others, and handling relationships etc. these positive characteristics of emotional intelligence enhanced the academic achievement in Biological science.
- III. In the present study the researcher hypothesized that student with favorable and unfavorable Attitude towards science differs significantly in terms of their effects on Academic achievement in Biological science. Findings of the study clearly revealed that students with favorable Attitude towards science have more influence on Academic achievement in Biological science than the students with unfavorable Attitude towards science. This may be due to that a favourable attitude makes the work not only easier but also more satisfying. An unfavorable attitude makes the task harder, more tedious and unpleasant.

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